LANCASHIRE COUNTY COUNCIL

ANNUAL REPORT

of the

COUNTY ANALYST

for

THE YEAR 1956.

PRESTON :
PRINTED BY T. SNAPE & CO., LTD., BOLTON'S COURT.
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The Chairman of the Finance Committee :

COUNTY COUNCILLOR R. GUYMER, J.P.

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LANCASHIRE COUNTY LABORATORY

STAFF 1957.

County Analyst :
G. H. WALKER, PH.D., B.SC., F.R.I.C.

Deputy County Analyst :
A. C. BUSHNELL, F.R.I.C.

Senior Assistant Analyst :
R. ARNOT, B.SC., F.R.I.C.

Second Senior Assistant Analyst :
M. S. GREEN, B.SC., A.R.I.C.

Assistant Analysts :
MISS C. MAYNE, B.SC., A.M.C.T., A.R.I.C.
R. E. BRIDGE, M.SC.
J. L. WILLIAMS.
G. S. MEADOWS, F.R.I.C.
MRS. D. FORBES, B.SC.
G. W. EARNSHAW.
K. FISHER.

Laboratory Assistants :
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MISS S. CHESWORTH.
MISS M. HARRISON.

Clerical Staff :
E. L. SIMPSON, T.D., F.C.C.S.
H. HIGGINSON, A.C.C.S.
MISS O. THOMAS.
MISS A. BURNS.

Laboratory Attendant :
MRS. A. E. AITKEN.

LANCASHIRE COUNTY COUNCIL

ANNUAL REPORT OF THE COUNTY ANALYST FOR THE YEAR 1956.

To the Chairman and Members of the Lancashire County Council.

I have the honour to submit for your consideration my eleventh Annual Report which deals with the work carried out in the County Laboratory during the year ended 31st December, 1956. The total number of analyses and tests carried out in this period was 13,445 ; in order to facilitate reference these have been grouped under the following headings :—

The total number of samples from all sources examined during the year is the highest recorded for the laboratory and is over double the number examined annually in any year prior to 1947. The number of samples examined for the County under the Food and Drugs Act and the Fertilisers and Feeding Stuffs Act (excluding however milk samples submitted for Phosphatase, Methylene Blue or Turbidity Tests) was 8,293 and the number of Food and Drugs samples submitted by the ten Autonomous Food and Drugs Authorities, for which your Analyst acts as Public Analyst, was 2,188.

The number of Food and Drugs samples submitted by the County Sampling Officers during the year 1956 was 8,215, as against 8,373 during previous year and 8,089 in the year 1954 ; the rate of samples per 1,000 of the population was 5·94 in the year under review, 6·13 in 1955 and 5·93 in 1954.

The number of County Food and Drugs Samples has therefore been maintained well above the level reached in 1947 (6,819). Prior to 1947, the highest figure was 5,263 in the year 1933. During the year the number of samples found to be adulterated or unsatisfactory was 340 ; this corresponds to an adulteration rate of 4·1 per cent., as against 4·9 per cent. in the year 1955, and 5·1 per cent. in the year 1954. Table 4 gives the percentage adulteration for the last 10 years and it will be seen that there has been an appreciable drop in this figure since the year 1947. Viewed in the light of the figures for the last 10 years the adulteration rate for the year, 1956, cannot be regarded as altogether unsatisfactory and it is, in fact, the first time since the year 1939 that the adulteration rate has come within the range for the 10 years, 1929–1938, which preceded the war when the percentage adulteration varied from 2·6 to 4·2.

In addition to Food and Drugs samples the County Sampling Officers submitted 1,152 samples of heat-treated milk for examination by the Phosphatase test, the half-hour Methylene Blue test or by the Turbidity test as against 1,148 samples submitted in the previous year. Of these, 13 failed to pass the Phosphatase test and four samples failed to pass the statutory Methylene Blue test, the corresponding figures for the year 1955 being 10 and three. In addition, four samples of raw milk were submitted for examination by the Phosphatase and Methylene Blue tests. The number of Specified Areas in the County in which only designated milks can be sold is continually increasing due to the making of further Milk (Special Designations) (Specified Areas) Orders, one more of which affecting the County came into operation during the year under review. By the end of 1956, a total of 51 of the 92 County Districts in the County Food and Drugs Area had become Specified Areas. As a result of this policy on the part of the Government, more and more milk sold under special designations will be consumed and in view of the fact that it is the duty of the Food and Drugs Authority to enforce the provisions of Section 37 of the Food and Drugs Act, 1955, it follows that an increased number of samples is now being taken by County Sampling Officers in the County Districts concerned for submission to the County Laboratory for examination by the statutory Phosphatase, Half-hour Methylene Blue or Turbidity tests. A reference to page 100 of this report will show that one successful prosecution was instituted during the year in respect of raw undesignated milk sold in a Specified Area and that one prosecution in respect of a similar offence was dismissed.

As usual some two-thirds of the Food and Drugs samples submitted by the County Sampling Officers consisted of samples of milk. Of 5,497 milk samples 203 were found to be adulterated which represents an adulteration rate of 3·7 per cent. The corresponding figure for the year 1955 was 4·8 per cent. and for the year 1954 it was 5·6 per cent. Milk adulteration in the County of Lancaster has shown consistent and appreciable decreases since the year 1946. It is reasonable to assume that these decreases are in some measure due to the increased sampling which has occurred since that year.

The adulteration rate for samples other than milk was 5·0 per cent. and is 0·1 per cent. lower than that obtained in the year 1955 when the figure was 5·1 per cent. The adulteration rate for the last ten years has varied from 2·8 to 5·1 per cent., the former figure in the year 1950 and the latter in the year 1955. The commodities which showed a relatively high proportion of unsatisfactory samples and, therefore, contributed especially to the adulteration rate included fish paste, flour, ice-cream, sausages and samples whose labels did not conform to the requirements of the Labelling of Food Order. An examination, however, of table 24 and the sections of the report concerned with the commodities just mentioned will bring to light the fact that many of the samples reported as unsatisfactory showed only slight irregularities in composition or minor infringements of labelling requirements.

During the year several new Statutory Regulations or Orders have been made which affect the work of the Public Analyst. Particular mention should be made of the Milk and Dairies (Channel Islands and South Devon Milk) Regulations, 1956, which make Food and Drugs Authorities now responsible for enforcing the absolute standard of not less than 4 per cent. milk fat prescribed for Channel Islands Milk and for South Devon Milk. Similarly, the Flour (Composition) Regulations, 1956, now make Food and Drugs Authorities responsible for the control of certain compulsory additions to flour, *i.e.*, Creta Praeparata, Iron, Vitamin B_1 and Nicotinic Acid. The Bread (Amendment No. 2) Order, 1956, deletes the definition of " National Milk Bread " from the principal Order and thereby removes a definition which was, to say the least, unfortunate in that the name selected for this commodity included the unqualified word " milk " when, in fact, what was actually required to be present in the bread was only skim milk powder. In addition to actual new Regulations several reports of the Food Standards Committee have been published during the year by the Ministry of Agriculture, Fisheries and Food. One of these makes recommendations as to standards for sausages and another is concerned with the composition of processed cheese and cheese spread.

For the first time in this report samples containing extraneous matter (*i.e* fragments of broken glass, etc.) have, for convenience, been grouped together and a similar procedure has been adopted with samples of food found to contain insects. There is also a short section dealing with two rather interesting samples which contravened the requirements of the Pharmacy and Medicines Act and one of these, incidentally, illustrates in rather a striking manner the length of time for which the Vitamin A content of Cod Liver Oil can be preserved provided the oil is protected from the action of light and air.

In my reports for the years 1953, 1954 and 1955 it was necessary to draw attention to the unsatisfactory manner in which certain Soft Drinks sold ready for consumption in one-third pint bottles had been labelled. During the years 1954 and 1955 successful prosecutions were instituted because certain vendors had even gone to the length of labelling their products as orange juice when, in fact, they only consisted of soft drinks containing a relatively small proportion of actual orange or orange juice. Your Committee, in 1954, referred this matter to the County Councils Association with a view to representations being made to the Minister for an amendment to the appropriate Order to ensure correct labelling and a minimum standard for the actual fruit content of these drinks. While no amendment to the Order has yet been made it is possible to report that there has been an improvement in the position during the year under review, in so far, at least, as Lancashire is concerned. In the section of this report dealing with Soft Drinks and Fruit Juices only one instance is recorded where it was necessary to draw attention to the unsatisfactory labelling of a soft drink sold ready for consumption in a one-third pint bottle and there were no instances of samples submitted as fruit juices which proved upon analysis to be anything other than genuine fruit juice.

An unusual feature of the report is the number of samples of fish paste which have been found to be unsatisfactory in regard to either the type or amount of fish present. Of the eight samples reported upon adversely, six were submitted as Salmon Paste, and in respect of three of these legal proceedings were successfully instituted, two for deficiencies in fish content and the third for selling a fish paste made from dyed white fish as salmon paste. It should perhaps be stated that all the unsatisfactory samples were of local manufacture and were sold loose by weight, *i.e.*, they were not prepacked commodities sold in the usual hermetically sealed jars. Another very unusual sample, which was submitted as the result of a complaint following a private purchase, had been bought as canned salmon steak but the contents of the tin were found to

consist solely of salmon hearts and not salmon as normally understood. This was an isolated instance and had obviously resulted from a mistake at the canning factory.

It will be seen from the report that the composition of ice-cream has been maintained at a satisfactory level and that no samples of ice lollies contained excessive quantities of any toxic metal. While a relatively high proportion of sausage samples were reported to be deficient in meat, the deficiencies in many cases were only slight. The average meat content for beef sausage was found to be very satisfactory while that for pork sausage showed a slight improvement over the figure for the previous year. Of the 17 samples of Penicillin tablets examined only one was reported upon adversely. This was due to the error of dispensing tablets of the wrong strength and not to any deterioration of the tablets on storage. On the other hand, serious deterioration due to storage was found in a sample of soluble aspirin tablets for children which was found to contain approximately eleven times the permitted limit for free salicylic acid. Serious deterioration due to storage was also found in two samples of Amphetamine nasal inhalers purchased from one shop, both of these contained less than half the amount of Amphetamine declared to be present.

In addition to food and drugs samples and other samples discussed in Parts I to IV of the report, mention is made on pages 111 to 120 of a number of miscellaneous samples which may be of interest. These include investigations in connection with atmospheric pollution, the examination of samples containing extraneous matter, the examination of potatoes to ascertain whether a taint was due to chemical contamination or to staleness, the work carried out on anti-smoking tablets in order to ascertain whether they contained any harmful substance or whether, in the opinion of your Analyst, a declaration of composition should appear on the label, the examination of dried full cream milk submitted as the result of a complaint that a baby became ill after having feeds made from this particular commodity and the examination of samples submitted in connection with Co-ordinated Purchasing, etc.

The record number of samples submitted to the County Laboratory during the year 1956 has again placed very heavy demands on all members of the staff. These demands have been accentuated by the fact that almost all food and drugs legislation in recent years has resulted in the formulation of new standards, which, for their efficient enforcement, entail additional and often very intricate work on the part of the analyst. In recording my appreciation of the loyal support I have received from

the staff in carrying out the work described in this report, I feel that this could not have been accomplished without, having had, at the same time, the ready co-operation of the County Sampling Officers and the Sampling Officers of the Autonomous Food and Drugs Authorities.

In conclusion, I desire to tender to the members of the County Council and to the County Medical Officer of Health my thanks for their continued help and unfailing interest shown in the work of the laboratory.

I have the honour to be, Mr. Chairman, Ladies and Gentlemen,

Your obedient Servant,

GEO. H. WALKER,
County Analyst.

The County Laboratory,
County Hall,
Preston,

10th July, 1957.

Total Samples Examined.

During the year 1956, a total of 13,445 analyses and tests have been carried out in the County Laboratory. They are classified in the following table :—

Table 1.

County Samples—		
Food and Drugs Act (including 5,497 milks)		8,215
Appeal-to-Cow		27
Fertilisers and Feeding Stuffs Act, 1926		51
Food and Drugs Act samples (including eleven Appeal-to-Cow) from the following autonomous Food and Drugs Authorities—		
Borough of Chorley	107	
Borough of Darwen	76	
City of Lancaster	181	
Borough of Leigh	159	
Borough of Middleton	166	
Borough of Morecambe and Heysham	162	
County Borough of Preston	605	
County Borough of Southport	342	
Urban District of Huyton-with-Roby	347	
Urban District of Newton-le-Willows	43	
		2,188
Fertilisers and Feeding Stuffs Act, 1926—		
Preston County Borough		2
Southport County Borough		6
Other Samples (from all sources including the County)—		
Potable Waters		100
Other Waters and Effluents		20
Miscellaneous		328
Milk Samples.—Phosphatase Tests		1,174
Milk Samples.—Methylene Blue Tests		1,163
Milk Samples.—Turbidity Tests		171
Total number examined		13,445

The total number of samples analysed in the year is compared with the total numbers similarly classified for the previous years 1912–1955, in table 2. It will be seen from the table that, since the year 1912, the grand total of samples examined amounts to 281,753.

Table 2.

Total number of Samples examined during the years 1912 to 1956.

Year.	County Food and Drugs.	Other Authorities Food and Drugs.	County Appeal-to-cow Samples.	Other Authorities Appeal-to-cow Samples.	Fertilisers and Feeding Stuffs Act.	Waters and Effluents.	Miscellaneous and Departmental.	Total Phosphatase, Methylene Blue and Turbidity Tests	Total.
1912–1944	149866	2020	2016	34	706	2211	2777	...	159630
1945	1731	292	3	16	17	58	8	...	2125
1946	4122	576	107	8	29	51	36	67	4996
1947	6819	962	110	13	34	48	35	1062	9083
1948	6958	783	59	13	31	46	88	1052	9030
1949	7700	1060	53	10	52	77	98	1425	10475
1950	8104	1040	38	1	58	113	149	1595	11098
1951	8501	1337	28	9	54	196	203	1602	11930
1952	8622	1418	40	12	53	126	208	1745	12224
1953	8635	1345	50	11	59	112	237	1797	12246
1954	8089	1612	67	3	62	84	250	1949	12116
1955	8373	1983	49	5	76	118	288	2463	13355
1956	8215	2177	27	11	59	120	328	2508	13445
1912–1956	235735	16605	2647	146	1290	3360	4705	17265	281753

PART I.—SAMPLES TAKEN UNDER THE FOOD AND DRUGS ACT, 1955.

The Food and Drugs Act, 1955, came into operation on the 1st January, 1956, and this report, therefore, contains an account of the first complete year's work carried out under its provisions. The Act consolidates and places on a permanent footing those parts of the 1938 Act and other post-war Acts and Regulations which were in operation up to the 1st January, 1956. The Food and Drugs Act, 1955, may be said, therefore, to bring to an end the period brought about by the war, during which food and drugs legislation was sub-divided under a number of Acts and Regulations.

It is usual in this report to draw attention to any new Regulations made during the year under review which have special bearing on the work of the Public Analyst. The following list contains the more important of these :—

The Milk and Dairies (Channel Islands and South Devon Milk) Regulations, 1956.

The Bread (Amendment No. 2) Order, 1956.

The Flour (Composition) Regulations, 1956.

The Food Standards (Curry Powder) (Amendment) Regulations, 1956.

The Food Standards (Tomato Ketchup) (Amendment) Regulations, 1956.

In addition to the above new Regulations the Food Standards Committee of the Ministry of Agriculture, Fisheries and Food published four reports during the year 1956. These made recommendations with regard to the limits for Copper in foods, the composition of Sausages, the composition of processed Cheese and Cheese Spread, and the use of emulsifying and stabilising agents in foods. The above mentioned new Orders and Reports are described briefly below or in the sections of this report which deal with the commodities concerned.

It will be remembered that in this report for the year 1955 adverse comment was made in respect of the Bread (Amendment) Order, 1955, in that it provided for the production of a commodity to be known as " National Milk Bread " although the ingredient to be used was skim milk powder and not fresh full cream milk or full cream milk powder. It was felt that the use of the unqualified word " milk " in the name of this commodity did not convey to the purchaser the true nature of the ingredient present. Subsequently, however, the Bread (Amendment No. 2) Order, 1956, was made which came into force on the 30th September, 1956. The main purpose of this amendment Order was to abolish all price control on bread but the opportunity was also taken to delete from the principal Order certain definitions including that of " National Milk Bread " so that this name no longer has any significance.

The Food Standards (Curry Powder) Order, 1949, prescribed a maximum limit for Lead in curry powder of 10 parts per million. The Food Standards (Curry Powder) (Amendment) Regulations which came into operation on the 2nd August, 1956, have the effect of amending the previous Lead limit and increasing it to 20 parts per million. On the same date the Food Standards (Tomato Ketchup) (Amendment) Regulations came into operation and these prescribe a maximum limit for Copper

in Tomato Ketchup, Catsup, Sauce or Relish of 20 parts per million parts of the commodity as sold instead of, as previously, a maximum limit of 50 parts of Copper per million parts of the dried total solids.

The first Food Standards Committee report referred to above was published in February, 1956, and was concerned with recommendations for limits for the Copper content of foods. It was the second report on this subject and followed representations which had been made by trade and other interests with regard to the first report published in August, 1951. The revised recommendations confirm the general maximum limits previously recommended, *viz.*, 2 parts per million of Copper in beverages ready-to-drink and 20 parts per million for other foods. The list of foods for which special limits were recommended has been extended by adding limits of 7 parts per million for non-alcoholic beverages prepared from cider and for concentrated soft drinks, 20 parts per million for constituents used in soft drinks, 60 parts per million (calculated on the dry matter) for yeast and yeast products and 300 parts per million in solid pectin.

The Preservatives Sub-Committee of the Food Standards Committee of the Ministry of Agriculture, Fisheries and Food have already, in the years 1954 and 1955, submitted two reports, one dealing with antioxidants and the other with colouring matters. In October of the year under review a further report dealing with emulsifying and stabilising agents was published. While, in general, such agents are used to prepare and stabilise fat-in-water or water-in-fat emulsions they may also be used in foods because they possess other properties, *i.e.*, crumb-softening agents used in the baking trade and frothing agents used in the soft drinks industry. The report covers all such uses but it recommends that certain substances which possess emulsifying properties but which are common food ingredients or which are normally present in amounts larger than would be necessary for their use as emulsifying agents should be specifically excluded from any statutory definition of emulsifying agents. The following is the list of substances which it is proposed should be excluded from the definition :—

> " Agar, alginic acid, calcium and sodium alginates, carrageen, edible gums, dextrin, sorbitol, pectin, sodium and calcium pectate, ' emulsifying salts ' (sodium citrate, phosphates and tartrate), calcium lactate, lecithin, albumen, gelatin, quillaia, saponin, hydrolysed proteins, modified starches."

At the present time, with the exception that cream may not contain a thickening substance, there are no statutory regulations governing the addition of emulsifying or stabilising agents to food. The Report

proposes that any future regulations should follow the procedure recommended in the previous reports on antioxidants and colouring matters and should prescribe a permitted list of emulsifying agents rather than prescribe a prohibited list and allow all other substances to be used indiscriminately. It is, of course, also recommended that provision should be made for adding further substances to the permitted list provided that it can be shown that they are not injurious and that their use would benefit the consumer. The permitted list at present recommended includes the following :—

> "Super-glycerinated fats, synthetic lecithin, propyleneglycol alginate, propyleneglycol stearate, methyl cellulose, methyl ethyl cellulose, sodium carboxymethyl cellulose, stearyl tartrate, diacetyl tartaric acid esters of super-glycerinated fats, monostearin sodium suphoacetate, sorbitan esters of fatty acids."

It is not proposed that any specific limit should be set to the amount of the above substances permitted except that it should always be the smallest quantity consistent with the best commercial practice. The Report includes specific recommendations with regard to a few foods. Milk should not be permitted to contain emulsifying agents and bread, because of the quantities consumed by all sections of the community, should only be permitted to contain super-glycerinated fats and stearyl tartrate. The present prohibition of thickening substances in cream should be extended to reconstituted cream. It is probable that some emulsifying agents might be used as fat extenders or substitutes for eggs and the purchasing public would be prejudiced if the normal amounts of fat and eggs in foods were reduced by the use of such substances. The Sub-Committee, however, consider that this point is safeguarded by the Food and Drugs Act and the Labelling of Food Order and by a recommendation that any emulsifying agent offered for sale as such should bear its chemical name and a statement that it is of the necessary purity for use in food. It is recommended that descriptions suggesting that a product is a substitute for fat or eggs should be prohibited.

Certain substances were brought to the notice of the Sub-Committee which, however, they considered should not be classified as emulsifying or stabilising agents but with regard to the use of which they made the following special observations. Brominated vegetable oils are used to stabilise emulsion flavours for use in soft drinks and the Sub-Committee see no objection to their continued use for this purpose. They do not consider that polymerised oils should be permitted in food but there would appear to be no objection to their use as tin-greasing emulsions in the baking trade. Special observations were also made with regard to two silicone products. Methylpolysiloxane is an anti-foam agent used

in food processing but it should not be present to the extent of more than 10 parts per million in the finished food and it should not be added to milk. Methylphenylpolysiloxane is a silicone resin used as a heat-cured glaze on tins in the baking trade to replace greasing fats ; there would appear to be no objection to its use for this purpose.

The Food Standards Committee also published in November, 1956, a report on Processed Cheese and Cheese Spread. This was their second report on these products, the first being published in August, 1949. The recommendations then made can be very briefly summarised as follows :—

	Minimum butterfat content in the dry matter.	Maximum moisture content.
Processed cheese	48%	42%
Processed cheese of the Gruyere and Emmenthal varieties	45%	45%
Cheese spread	45%	48%

Trade representations made after the publication of the first report made it clear that there was considerable divergence of view particularly about the standard which should apply to processed Continental cheeses and with regard to the standard then proposed for cheese spread. While this last standard was acceptable to some manufacturers others were making cheese spreads with a moisture content of about 60 per cent. and they felt that provision should be made in any standard for products of this type. A standard for cheese spread of not more than 60 per cent. moisture and not less than 20 per cent. butterfat in the product as sold is in operation in the U.S.A. The Food Standards Committee has given consideration to these and other representations and the standards now proposed in the report published in the year under review are as follows :—

	Minimum butterfat content.	Maximum moisture content.
Processed Cheddar or Cheshire cheese	... 48% in dry matter	... 42%
Processed cheese ...	... 45% in dry matter	... 45%
Cheese spread ...	... 20% on the product as sold	... 60%

The Food Standards Committee also expressed certain other views in the Report and these include : (*a*) the name " processed cheese " should apply only to a product made by heat treating cheese and the only other ingredients should be emulsifying salts and any water or colouring matter

considered necessary. The whole of the butterfat present should be derived from cheese. (*b*) " Cheese spread " is a compounded article and, in addition to the ingredients present in processed cheese, it may also contain other dairy products such as butter and skimmed milk but the whole of the fat present should be butterfat. (*c*) Flavoured processed cheeses and cheese spreads and other mixtures, such as cheese spread and chopped ham, should contain processed cheese and cheese spread conforming to the appropriate standard. (*d*) The Committee do not consider that the ingredients of processed cheese need to be disclosed on the label but in the case of cheese spread the ingredient should be declared. Furthermore, in the case of flavoured products the name of the flavouring ingredient should be included in the description. (*e*) Any declaration of butterfat content on the label should be optional but if declared it should be in terms of percentage by weight of the product as sold and not a declaration of the percentage by weight of butterfat in the dry matter. The Committee feel that this latter method of declaring the butterfat content could be misleading to any ordinary consumer although it is traditionally employed in the cheese trade. It has the advantage of being constant and is independent of the varying moisture content of cheese during ripening and storage ; on the other hand, in compounded products such as cheese spread, the more the amount of water that is incorporated the less will be the amount of fat actually present in the final product so that two products might have the same percentage of butterfat in the dry matter but widely differing butterfat percentages in the material as sold.

Particulars of Samples of Food and Drugs submitted by County Sampling Officers.

In Table 3 there is a list of all the articles of food and drugs which were submitted during the year 1956 from the County of Lancaster together with the number of each kind and also the number found to be adulterated.

Table 3.

Samples examined under the Food and Drugs Act during 1956.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Acetic Acid, solution of ...	...	2	...	2	...	1	...	1
Almonds, Ground ...	...	18	...	18	...	3	...	3

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Almond Oil... ...	...	10	...	10	...	...	...	...
Arrowroot	...	9	...	9	...	...	...	...
Aspirin Tablets, Buffered	...	1	...	1	...	...	...	...
Aspirin Tablets, Children's ...	...	2	...	2	...	1	...	1
Baby Food, Canned (Rice, etc.) ...	...	1	...	1	...	...	...	...
Baby Food (Milk food)	...	1	...	1	...	...	...	...
Bacon	...	16	...	16	...	...	...	...
Baking Powder ...	...	16	...	16	...	...	...	...
Barley	...	31	...	31	...	2	...	2
Biscuits	...	9	...	9	...	...	...	...
Bismuth Lozenges, Compound ...	...	2	...	2	...	...	...	...
Blackcurrant Syrup	...	1	...	1	...	...	...	...
Blancmange Powder	...	23	1	24	...	2	...	2
Blaud's Pills ...	...	4	...	4	...	1	...	1
Borax	...	19	...	19	...	2	...	2
Boric Acid Powder and Crystals ...	...	7	...	7	...	...	...	...
Boric Acid Ointment ...	...	16	...	16	...	1	...	1
Brandy	2	...	...	2	...	...	...	...
Bread	...	31	...	31	...	2	...	2
Bread, Brown ...	...	6	...	6	...	1	...	1
Bread, Milk ...	...	1	...	1	...	1	...	1
Bread, Fancy (Fruit, etc.) ...	...	4	...	4	...	...	...	...
Bread, Starched Reduced	...	1	...	1	...	...	...	...
Butter	...	42	...	42	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Cake Decorations, Edible	...	1	...	1	...	...	...	...
Cake Mixture, Sweetened ...	...	9	...	9	...	2	...	2
Camphorated Oil ...	...	16	...	16	...	...	...	...
Castor Oil	...	12	...	12	...	...	...	...
Cayenne Pepper ...	...	1	...	1	...	...	...	...
Cheese (including processed cheese)	...	27	...	27	...	1	...	1
Cheese, Cream ...	...	2	...	2	...	1	...	1
Cheese, Spread ...	...	5	...	5	...	1	...	1
Cheese and Onion Spread	...	1	...	1	...	...	...	...
Chewing Gum ...	...	8	...	8	...	...	...	...
Chicken Fillets, Canned	...	1	...	1	...	...	...	...
Chicken, Minced, Bottled	...	1	...	1	...	...	...	...
Chicken in Jelly, Canned	...	1	...	1	...	...	...	...
Chocolate Cake Coating	...	1	...	1	...	...	...	...
Chocolate, Drinking	...	2	...	2	...	...	...	...
Chutney	...	1	...	1	...	...	...	...
Cinnamon, Ground	...	10	...	10	...	...	...	...
Cocoa	...	33	1	34	...	2	...	2
Coconut, Desiccated	...	2	...	2	...	...	...	...
Coconut, Shredded in Syrup, Canned	...	1	...	1	...	...	...	...
Cod Liver Oil ...	...	11	...	11	...	1	...	1
Cod Liver Oil Emulsion ...	...	2	...	2	...	...	...	...
Codeine Tablets, Compound ...	...	12	...	12	...	1	...	1

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Coffee	...	26	...	26	...	...	...	...
Coffee Extract, Dry	...	1	...	1	...	...	...	...
Coffee and Chicory Essence, Liquid, Sweetened ...	...	6	...	6	...	...	...	...
Coffee and Chicory Extract Mixture, Dry	...	4	...	4	...	...	...	...
Coffee Flavoured Beverage, Dry ...	...	3	...	3	...	...	...	...
Colouring Materials	...	1	...	1	...	...	...	...
Condiment, Non-brewed	...	2	...	2	...	...	...	...
Cooking Fat, Compound ...	...	36	4	40	...	...	...	...
Cornflour	...	23	...	23	...	...	...	...
Cough Medicine ...	...	2	...	2	...	...	...	...
Cream, Single and Double	...	14	...	14	...	2	...	2
Cream, Sterilised ...	...	25	...	25	...	...	...	...
Cream, Imitation, Powder	...	1	...	1	...	...	...	...
Cream of Tartar ...	...	14	...	14	...	...	...	...
Curry Powder ...	...	6	...	6	...	...	..	...
Custard Powder ...	...	20	1	21	...	2	...	2
Celery, Canned ...	...	1	...	1	...	1	...	1
Dandelion Coffee ...	...	1	...	1	...	...	...	...
Digestive Mints ...	...	1	...	1	...	1	...	1
Dripping	...	20	...	20	...	1	...	1
Epsom Salts ...	...	27	...	27	...	...	...	...
Fever Mixture ...	...	1	...	1	...	...	...	...
Figs, Syrup of ...	...	5	...	5	...	...	...	...
Fish, Bottled ...	...	1	...	1	...	1	...	1

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Fish, Canned ...	...	20	...	20	...	...	...	...
Fish Paste	3	9	...	12	3	4	...	7
Flavouring Materials	...	16	...	16	...	...	...	...
Flour	...	42	...	42	...	8	...	8
Flour, Self-raising ...	...	28	...	28	...	...	...	...
Flour, Self-raising (Egg, Sweetened)	...	1	...	1	...	...	...	...
Flour Confectionery (Jam Tarts, etc.)	...	48	...	48	...	1	...	1
Friar's Balsam ...	...	2	...	2	...	...	...	...
Fruit, Canned ...	...	17	2	19	...	...	...	...
Fruit, Curd... ...	...	24	...	24	...	2	...	2
Fruit, Dried ...	...	50	...	50	...	...	...	...
Fruit, Fresh (Apples, Oranges, etc.)	...	34	...	34	...	2	...	2
Fruit in Jelly, Bottled	...	3	...	3	...	...	...	...
Fruit Juices (Bottled and Canned)	...	10	...	10	...	...	...	...
Gelatine	...	10	...	10	...	1	...	1
Gin	11	...	...	11	...	...	...	...
Ginger, Ground ...	...	12	...	12	...	1	...	1
Ginger Wine Essence	...	1	...	1	...	...	...	...
Glucose with Vitamin D ...	...	2	...	2	...	...	...	...
Glucose Tablets ...	...	2	...	2	...	...	...	...
Glycerin	...	14	...	14	...	3	...	3
Glycerin of Thymol	...	1	...	1	...	1	...	1
Golden Raising Powder	...	9	...	9	...	...	...	...
Gravy Browning ...	...	19	...	19	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Gravy Powder	...	1	...	1	...	...	...	...
Gravy Salt	...	1	...	1	...	...	...	...
Gregory's Powder ...	...	1	...	1	...	...	...	...
Gripe Water ...	...	2	...	2	...	...	...	...
Health Food ...	...	1	...	1	...	1	...	1
Herbal Food, Malted	...	1	...	1	...	...	...	...
Herbal Medicine ...	...	3	...	3	...	1	...	1
Herbs, Dried, Culinary	...	13	...	13	...	...	...	...
Honey	...	1	...	1	...	...	...	...
Hypophosphites, Compound Syrup of	...	4	...	4	...	...	...	...
Ice-Cream	1	50	...	51	...	5	...	5
Ice-Cream, Cold Mix Powder ...	...	1	...	1	...	...	...	...
Ice Lollies	...	11	...	11	...	...	...	...
Indian Brandee ...	...	2	...	2	...	...	...	...
Invalid Food ...	...	2	...	2	...	...	...	...
Iodine Ointment ...	...	9	...	9	...	...	...	...
Iodine Paint ...	...	1	...	1	...	...	...	...
Iodine, Ticture of ...	...	12	...	12	...	1	...	1
Jam...	...	15	1	16	...	...	...	...
Jelly, Table ...	...	41	...	41	...	1	...	1
Jelly, Table, Compound ...	...	1	...	1	...	...	...	...
Junket Crystals ...	...	1	...	1	...	...	...	...
Lard	...	47	3	50	...	1	...	1
Laxative Chocolate	...	2	...	2	...	...	...	...
Laxative Tablets ...	...	2	...	2	...	...	...	...
Lemonade Crystals	...	1	...	1	...	1	...	1

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Lemonade Powder	...	4	...	4	...	...	...	...
Liquorice Powder, Compound ...	...	3	...	3	...	1	...	1
Macaroni, Spaghetti and Similar Products	...	2	...	2	...	...	...	...
Malt Extract ...	...	1	...	1	...	...	...	...
Malt Extract with Cod Liver Oil ...	...	6	...	6	...	2	...	2
Malt, Milk and Cocoa Beverages	...	9	...	9	...	...	...	...
Margarine	...	66	3	69	...	1	1	2
Marmalade (Diabetic) ...	...	1	...	1	...	...	...	...
Marzipan	...	5	...	5	...	...	...	...
Meat, Canned ...	...	40	...	40	...	3	...	3
Meat Extract ...	...	1	...	1	...	...	...	...
Meat Paste	...	20	...	20	...	1	...	1
Meat, Potted ...	...	2	...	2	...	1	...	1
Meat Pudding, Canned	...	2	...	2	...	...	...	...
Meat, Tenderising Salt	...	1	...	1	...	...	...	...
Meat and Vegetables, Canned	...	1	...	1	...	...	...	...
Medicinal Herbs, Dried	...	1	...	1	...	...	...	...
Mercury, Ammoniated Ointment of ...	...	8	...	8	...	...	...	...
Meringue Powder ...	...	1	...	1	...	...	...	...
Milk	3,249	1,930	318	5,497	107	79	17	203
Milk, Channel Islands	165	16	...	181	9	...	...	9

Table 3—continued.

Samples.	Number examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Milk, Condensed, Full Cream, Sweetened ...	...	3	...	3	...	...	...	...
Milk, Condensed, Special Full Cream, Sweetened	...	2	...	2	...	...	...	...
Milk, Condensed, Full Cream, Unsweetened ...	...	11	...	11	...	...	...	...
Milk Condensed, Skimmed, Sweetened ...	...	8	...	8	...	...	...	...
Milk, Dried... ...	...	2	...	2	...	...	...	...
Milk Flavouring ...	...	2	...	2	...	...	...	...
Milk, Malted ...	...	2	...	2	...	...	...	...
Milk, Skimmed, and Fat Compound, Canned	...	1	...	1	...	...	...	...
Mince Pie, Canned	...	1	...	1	...	...	...	...
Mincemeat	...	18	...	18	...	...	...	...
Mint Sauce... ...	...	1	...	1	...	...	...	...
Mustard, Compound	...	3	...	3	...	...	...	...
Mustard, Compound, Liquid	...	2	...	2	...	...	...	...
Nasal Inhalers ...	...	10	...	10	...	2	...	2
Nutmeg, Ground ...	...	10	...	10	...	...	...	...
Nut Mixture, Ground	...	2	...	2	...	...	...	...
Nut Paste	...	2	...	2	...	...	...	...
Oatmeal	...	39	...	39	...	2	...	2
Oats, Breakfast ...	...	6	...	6	...	...	...	...
Olive Oil	...	29	...	29	...	...	...	...
Olives, Stuffed ...	...	1	...	1	...	...	...	...
Pancake and Yorkshire Pudding Mixture	...	5	...	5	...	...	...	...

Table 3—continued.

Samples.	Number examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Paraffin, Liquid ...	...	8	...	8	...	...	...	...
Parrish's Chemical Food	...	13	...	13	...	1	...	1
Pastry Mixture ...	...	4	...	4	...	...	...	...
Penicillin Tablets ...	...	17	...	17	...	1	...	1
Pepper, White ...	...	36	...	36	...	...	...	...
Pepper Flavoured Compound ...	...	1	...	1	...	...	...	...
Pickles	...	43	...	43	...	...	...	...
Pie Filling, Lemon Flavoured ...	...	2	...	2	...	...	...	...
Pudding (Christmas, etc.)	...	26	...	26	...	...	...	...
Pudding Mixture (Sweetened and Unsweetened) ...	...	6	...	6	...	...	...	...
Quinine, Ammoniated Tincture of ...	...	8	...	8	...	1	...	1
Ravioli in Tomato Sauce, Canned ...	...	1	...	1	...	...	...	...
Rennet, Essence of	...	...	1	1	...	...	...	...
Rice...	...	10	...	10	...	...	...	...
Rice, Creamed, Canned	...	1	...	1	...	...	...	...
Rice, Ground ...	...	2	...	2	...	...	...	...
Rose Hip Syrup ...	...	5	...	5	...	4	...	4
Rum	9	...	...	9	...	...	...	...
Rum Butter ...	...	1	...	1	...	...	...	...
Rye Crispbread ...	...	1	...	1	...	...	...	...
Saccharin Tablets ...	...	5	...	5	...	...	...	...
Sago...	...	9	...	9	...	3	...	3
Salad Cream ...	...	9	...	9	...	...	...	...

Table 3.—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Salmon and Potato Salad, Canned ...	...	1	...	1	...	...	...	...
Salmon and Spaghetti, Canned	...	1	...	1	...	...	...	...
Salmon, Potted ...	...	3	...	3	...	1	...	1
Salmon Steak, Canned	...	1	...	1	...	1	...	1
Salt	...	43	...	43	...	...	...	...
Salt, Celery ...	...	2	...	2	...	...	...	...
Salt, Garlic ...	...	1	...	1	...	...	...	...
Salt, Iodised ...	...	3	...	3	...	...	...	...
Sauce	...	20	...	20	...	...	...	...
Sausages, Beef ...	...	25	...	25	...	5	...	5
Sausages, Pork ...	...	33	1	34	...	15	...	15
Sausages, Canned ...	...	1	...	1	...	...	...	...
Sausage Meat, Beef	...	1	...	1	...	...	...	...
Sausage Rolls ...	...	13	...	13	...	...	...	...
Sedative Tablets ...	...	3	...	3	...	...	...	...
Seidlitz Powders ...	...	9	...	9	...	1	...	1
Seidlitz Powders, Double Strength	...	2	...	2	...	1	...	1
Seidlitz Powders, Extra Strong ...	...	2	...	2	...	...	...	...
Semolina	...	19	...	19	...	...	...	...
Shrimps, Canned ...	...	2	...	2	...	...	...	...
Sodium Bicarbonate	...	21	...	21	...	...	...	...
Soft Drinks, to be diluted	...	5	...	5	...	1	...	1
Soft Drink, Mineral Water ...	...	1	...	1	...	1	...	1
Soft Drinks, Orange Drinks ...	...	6	...	6	...	...	...	...

Table 3.—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Soft Drink, Pineapple Drink	...	1	...	1	...	1	...	1
Soft Drink, Tonic Water	...	1	...	1	...	1	...	1
Soft Drink Crystals	...	1	...	1	...	...	...	...
Soup Mixture (Dried Vegetables, Barley, etc.) ...	...	1	...	1	...	...	...	...
Soya Flour	...	1	...	1	...	...	...	...
Spice, Mixed, Ground	...	11	...	11	...	...	...	...
Spice, Pickling ...	...	1	...	1	...	...	...	...
Sponge Cake and Sponge Pudding Mixture, Sweetened ...	...	14	...	14	...	...	...	...
Sponge and Jelly Mixture	...	1	...	1	...	...	...	...
Suet, Shredded ...	...	16	...	16	...	...	...	...
Sugar	...	37	...	37	...	...	...	...
Sugar, Icing ...	...	14	...	14	...	...	...	...
Sulphadimidine Tablets B.P. ...	...	3	...	3	...	...	...	...
Sweets (including Chocolates and Sweets containing Butter) ...	...	58	...	58	...	...	...	...
Sweetmeat	...	3	...	3	...	...	...	...
Syrup	...	10	...	10	...	...	...	...
Table Creams, Mixture ...	...	1	...	1	...	...	...	...
Tapioca	...	24	...	24	...	...	...	...
Tartaric Acid ...	...	1	...	1	...	...	...	...
Tea	...	75	...	75	...	...	...	...
Teacakes, Currant...	...	1	...	1	...	...	...	...
Teething Powders ...	...	7	...	7	...	...	...	...

Table 3.—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Throat Lozenges ...	...	1	...	1	...	...	...	...
Tomatoes, Canned...	...	2	...	2	...	...	...	...
Tomatoes, Fresh ...	...	1	...	1	...	...	...	...
Tomato Juice, Canned	...	1	...	1	...	...	...	...
Tomato Purée, Canned	...	1	...	1	...	...	...	...
Travel Sickness Tablets	...	10	...	10	...	...	...	...
Treacle and Molasses	...	14	...	14	...	...	...	...
Trifle Pack	...	1	...	1	...	...	...	...
Turkey, Minced, Bottled	...	2	...	2	...	...	...	...
Vegetables, Canned	...	24	...	24	...	1	...	1
Vegetables, Dried (Peas, etc.) ...	...	51	...	51	...	2	...	2
Vegetable Extract, Bottled	...	1	...	1	...	...	...	...
Vegetarian Savoury Food	...	1	...	1	...	...	...	...
Vinegar	...	14	...	14	...	1	...	1
Vitamin Tablets ...	...	2	...	2	...	...	...	...
Viaminised Sweets	...	2	...	2	...	1	...	1
Wheatgerm, Stabilised ...	...	1	...	1	...	...	...	...
Whisky	34	...	...	34	...	...	...	...
Wine (British Sherry, British Ruby, etc.) ...	...	7	...	7	...	...	...	...
Yeast Extract ...	...	...	1	1	...	...	...	...
Yeast Tablets ...	...	1	...	1	...	...	...	...
Zinc Ointment ...	...	5	...	5	...	...	...	...
Totals ...	3,474	4,404	337	8,215	119	203	18	340

The Number of Commodities.

The variety of commodities on sale is now very large, and this is reflected in the number of different articles of which samples have been taken and submitted for analysis. Two hundred and fifty-seven different commodities consisting of food and drugs were examined during the year.

In order to obtain adequate sampling of the common articles of food it is the practice to issue quarterly lists of samples which assist the sampling officers to correlate their samples one with another and at the same time ensure that each area is satisfactorily sampled in respect of any particular commodity. Due to the desirability of allowing considerable latitude in the sampling of other articles where this may be indicated in the public interest, the variety of samples actually examined is considerably increased by the inclusion of commodities in less common demand.

Total Adulteration.

During the year under review, 8,215 samples of food and drugs were submitted for examination under the Act, and of these 340 were reported reported upon adversely; the total adulteration was, therefore, 4·1 per cent. This represents a decrease compared with the percentage of adulteration for the previous year (1955) when the figure was 4·9 per cent.

In table 4 the percentages of adulteration are given for the past 10 years. It will be seen that during this period the lowest figure is 4·1 which was reached during the year under review and that the average figure is 5·0 per cent. The percentage of adulteration for the year 1956 is also the lowest figure since the year 1939. In general, the adulteration during and subsequent to the war is considerably greater than that found in preceding years and the figure for the year under review represents the first occasion, since the war, that the adulteration rate has come within the range of that for the ten years 1929–1938, which immediately preceded the war, when the percentage adulteration varied from 2·6 to 4·2.

Table 4.

Percentage of Adulteration of County Samples of Food and Drugs, 1947–1956.

Year.	Total No. of Samples.	No. of Adulterated Samples.	Percentage of Adulteration.
1947	6,819	477	7·0
1948	6,958	399	5·7
1949	7,700	408	5·3
1950	8,104	363	4·5
1951	8,501	412	4·8
1952	8,622	404	4·7
1953	8,635	386	4·5
1954	8,089	417	5·1
1955	8,373	413	4·9
1956	8,215	340	4·1
1947–1956 ...	80,016	4,019	5·0

Analysis of County Food and Drugs Samples.

The point raised in the preceding paragraph is perhaps brought out more clearly in table 5 where the percentage of adulteration over the last 10 years is given side by side with the various types of samples and with the number of samples taken per 100,000 of the population. During the war years the rate of sampling dropped very considerably, in fact for the years 1942–1945 inclusive it was less than half that for the years immediately prior to the war. The total number of samples and the number of samples per 100,000 of the population for the year under review have been well maintained at the level reached during 1947 and the figures for for the last ten years are much higher than the corresponding figures for any of the previous years in the history of the County Laboratory.

Table 5.

Year.	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
Percentage of Adulteration	7·0	5·7	5·3	4·5	4·8	4·7	4·5	5·1	4·9	4·1
Total Samples ..	6,819	6,958	7,700	8,104	8,501	8,622	8,635	8,089	8,373	8,215
Formal Samples ..	2,318	2,478	3,011	2,798	2,751	2,654	3,220	2,817	3,300	3,474
Informal Samples ..	3,821	3,953	4,254	4,858	5,184	5,313	4,761	4,844	4,744	4,404
Private Samples ..	680	527	435	448	566	655	654	428	329	337
Number of Samples per 100,000 of the population	505	504	546	566	589	599	598	593	613	594

Total Adulteration : the County compared with other Areas.

Table 6 gives the percentage of adulteration for the year 1956 for certain other Food and Drugs Authorities whose figures were available at the time of writing. I am indebted to the Public Analysts of the various districts for the information included in this table and also for the figures included in tables 13 and 18. It will be seen that the figure for the County of Lancaster, viz., 4·1 per cent. is lower than the average (4·8 per cent) for the Authorities mentioned. The range of adulteration for the areas included in the table varied from 10·7 to 1·8 per cent.

Table 6.

Total Adulteration, 1956. Various Districts.

Area.	No. of Samples.	Per cent. of Adult.	Area.	No. of Samples.	Per cent. of Adult.
Durham, County ...	2,170	2·0	Birmingham ...	5,554	5·3
Kent, County ...	4,743	7·0	Bristol	3,021	2·8
Somersetshire, County ...	3,008	5·2	Leeds	2,231	1·8
Staffordshire, County ...	5,380	3·5	Leicester	2,603	4·8
Surrey, County ...	968	4·3	Liverpool	4,299	4·3
Worcestershire, County ...	4,918	10·7	Manchester ...	2,715	6·0

Total Adulteration : England and Wales.

It is interesting to compare the position as regards adulteration in Lancashire, which is 4·1 per cent., with the corresponding figures for the years between the wars for the whole of England and Wales. In table 7 there are given the figures for a long period, 34 years, omitting the years of

both wars. It will be seen that the total adulteration in Lancashire for the year under review is less than the average (6·6 per cent.) for England and Wales for the years between the wars. This is the ninth occasion since the year 1940 that the adulteration rate for the County has fallen below the average for that of England and Wales for all the years shown in the table, the first occasion being the year 1948, when the total adulteration rate was 5·7 per cent.

Table 7.

Percentage of Adulteration for England and Wales, 1900–1938.

Year.	Milk.			Total Samples.		
	Number examined.	Number adulterated.	Percentage of Adult.	Number examined.	Number adulterated.	Percentage of Adult.
*1900–1913...	569,916	62,318	10·9	1,250,686	105,076	8·4
1919	57,361	6,374	11·1	101,140	8,313	8·2
1920	62,463	5,797	9·3	111,797	7,903	7·1
1921	61,439	5,290	8·6	113,664	7,582	6·7
1922	60,274	4,624	7·7	113,860	7,106	6·2
1923	59,925	4,684	7·8	114,846	6,980	6·1
1924	62,133	4,773	7·7	118,000	6,987	5·9
1925	61,909	5,163	8·3	118,930	7,714	6·5
1926	62,507	4,625	7·4	120,617	7,044	5·8
1927	63,687	4,398	6·9	124,264	6,787	5·5
1928	67,350	5,542	8·2	129,034	7,524	5·8
1929	68,115	5,293	7·8	133,584	7,260	5·4
1930	69,311	4,581	6·6	136,515	6,496	4·8
1931	70,201	4,507	6·4	136,169	6,324	4·6
1932	72,940	5,307	7·3	137,981	7,019	5·1
1933	74,545	5,760	7·7	138,171	7,601	5·5
1934	76,930	5,506	7·2	140,583	7,451	5·3
1935	78,674	5,798	7·4	143,831	7,972	5·5
1936	80,082	5,706	7·1	146,438	7,802	5·3
1937	82,357	6,107	7·4	151,370	8,401	5·5
1938	80,025	6,141	7·7	149,073	8,433	5·7
Totals ...	1,942,144	168,294	8·7	3,830,553	253,775	6·6

* Figures for 1914–1918 and 1939–1956 inclusive, not available.

Adulteration in County Districts, etc.

There are 92 Districts shown in the Area of the County Food and Drugs Authority for the year under review.

Table 8 shows the number of samples taken and the number of adulterated samples in each of the 92 districts together with those relating to 10 autonomous areas. An examination of the table will show that adulteration was nil in 17 of the County Districts as against nil in 24 districts for the year 1955. None of the autonomous areas showed a total freedom from adulteration.

Table 8.

Adulteration in the County Districts and in the areas of ten Autonomous Food and Drugs Authorities during the year 1956.

District.	Milk.		Other Articles.		Total..	
	Samp-les.	Adult.	Samp-les.	Adult.	Samp-les.	Adult.
Abram U.D.C.	20	0	14	0	34	0
Adlington U.D.C. ...	19	0	20	1	39	1
Ashton-in-Makerfield U.D.C....	48	0	37	1	85	1
Aspull U.D.C.	21	0	14	0	35	0
Atherton U.D.C. ...	70	2	32	0	102	2
Audenshaw U.D.C. ...	34	2	26	2	60	4
Bacup Borough ...	85	4	37	1	122	5
Barrowford U.D.C. ...	17	0	8	2	25	2
Billinge and Winstanley U.D.C....	19	3	14	1	33	4
Blackburn R.D.C. ...	48	4	18	0	66	4
Blackrod U.D.C. ...	14	1	14	0	28	1
Brierfield U.D.C. ...	21	1	14	1	35	2
Burnley R.D.C. ...	62	7	24	0	86	7
Carnforth U.D.C. ...	20	2	20	2	40	4
Chadderton U.D.C. ...	88	0	78	7	166	7
Chorley R.D.C.	112	4	38	4	150	8
Church U.D.C.	19	0	11	0	30	0

Table 8—continued.

District.	Milk.		Other Articles.		Total..	
	Samples.	Adult.	Samples.	Adult.	Samples.	Adult.
Clayton-le-Moors U.D.C.	24	0	14	1	38	1
Clitheroe Borough ...	40	0	20	0	60	0
Clitheroe R.D.C. ...	45	1	12	0	57	1
Crompton U.D.C. ...	47	0	21	2	68	2
Dalton-in-Furness U.D.C....	39	2	20	0	59	2
Denton U.D.C.	85	9	50	7	135	16
Droylsden U.D.C. ...	100	1	29	2	129	3
Failsworth U.D.C. ...	58	0	44	3	102	3
Farnworth Borough ...	95	2	46	4	141	6
Fleetwood Borough ...	79	2	63	2	142	4
Formby U.D.C. ...	25	0	33	2	58	2
Fulwood U.D.C. ...	45	2	41	2	86	4
Fylde R.D.C.	55	4	31	0	86	4
Garstang R.D.C. ...	77	5	41	1	118	6
Golborne U.D.C. ...	40	0	45	4	85	4
Grange U.D.C.	15	1	16	3	31	4
Great Harwood U.D.C.	40	1	19	2	59	3
Haslingden Borough ...	49	2	21	0	70	2
Haydock U.D.C. ...	29	0	35	0	64	0
Heywood Borough ...	75	1	64	5	139	6
Hindley U.D.C.	49	1	43	1	92	2
Horwich U.D.C. ...	46	1	26	0	72	1
Ince-in-Makerfield U.D.C....	64	0	29	1	93	1
Irlam U.D.C.	48	0	27	0	75	0
Kearsley U.D.C. ...	36	0	20	0	56	0
Kirkham U.D.C. ...	39	0	7	0	46	0
Lancaster R.D.C. ...	77	5	37	4	114	9
Lees U.D.C.	38	1	13	0	51	1

Table 8—continued.

District.	Milk.		Other Articles.		Total..	
	Samples.	Adult.	Samples.	Adult.	Samples.	Adult.
Leyland U.D.C.... ...	42	2	36	2	78	4
Litherland U.D.C. ...	106	2	35	1	141	3
Little Lever U.D.C. ...	19	0	6	0	25	0
Littleborough U.D.C. ...	39	1	19	1	58	2
Longridge U.D.C. ...	20	3	8	1	28	4
Lunesdale R.D.C. ...	54	4	15	0	69	4
Lytham St. Annes Borough	84	4	67	3	151	7
Milnrow U.D.C.... ...	34	1	11	0	45	1
Mossley Borough ...	34	0	15	0	49	0
Nelson Borough... ...	103	0	64	1	167	1
Ormskirk U.D.C. ...	49	1	48	2	97	3
Orrell U.D.C.	38	5	14	0	52	5
Oswaldtwistle U.D.C. ...	85	6	9	0	94	6
Padiham U.D.C. ...	31	0	21	3	52	3
Poulton-le-Fylde U.D.C.	27	0	14	1	41	1
Preesall U.D.C.	11	0	6	0	17	0
Prescot U.D.C.	39	0	31	0	70	0
Preston R.D.C.	129	4	75	2	204	6
Prestwich Borough ...	122	0	62	6	184	6
Radcliffe Borough ...	71	3	79	2	150	5
Rainford U.D.C. ...	9	0	13	0	22	0
Ramsbottom U.D.C. ...	51	1	35	3	86	4
Rawtenstall Borough ...	91	1	34	2	125	3
Rishton U.D.C.	25	0	15	1	40	1
Royton U.D.C.	59	0	16	2	75	2
Skelmersdale U.D.C. ...	10	0	14	0	24	0
Standish-with-Langtree U.D.C. ...	24	1	28	1	52	2

Table 8—continued.

District.	Milk.		Other Articles.		Total..	
	Samp-les.	Adult.	Samp-les.	Adult.	Samp-les.	Adult.
Thornton Cleveleys U.D.C....	49	0	29	1	78	1
Tottington U.D.C. ...	28	1	14	1	42	2
Trawden U.D.C. ...	10	0	1	0	11	0
Turton U.D.C.	40	1	21	2	61	3
Tyldesley U.D.C. ...	56	0	34	3	90	3
Ulverston R.D.C. ...	124	10	25	3	149	13
Ulverston U.D.C. ...	45	5	27	1	72	6
Up Holland U.D.C. ...	12	0	14	2	26	2
Urmston U.D.C. ...	121	2	85	8	206	10
Walton-le-Dale U.D.C.	68	2	41	2	109	4
Wardle U.D.C.	16	0	9	1	25	1
Warrington R.D.C. ...	165	2	24	0	189	2
West Lancashire R.D.C.	123	5	85	1	208	6
Westhoughton U.D.C. ...	59	2	20	2	79	4
Whiston R.D.C.	179	3	59	0	238	3
Whitefield U.D.C. ...	35	1	54	4	89	5
Whitworth U.D.C. ...	19	0	16	1	35	1
Wigan R.D.C.	62	0	14	0	76	0
Whithnell U.D.C. ...	17	0	3	0	20	0
Worsley U.D.C.	88	2	67	3	155	5
Miscellaneous	599	57	0	0	599	57
Total County Districts ...	5497	203	2718	137	8215	340
Ten Autonomous Food and Drugs Authorities	1364	54	813	59	2177	113
Total—All Sources ...	6861	257	3531	196	10,392	453

Adulteration of Milk in the County.

The number of milks submitted under the Food and Drugs Act during the year was 5,497, and of these 203 were reported against; the amount of adulteration was, therefore, 3·7 per cent. This figure, as will be seen from table 9, is considerably lower than the average for the last 10 years and is the lowest shown in the table.

Table 9.

Percentage of Adulteration of Milk Samples, 1947–1956.

Year.	No. of Samples.	No. of Adulterated Samples.	Percentage of Adulteration.
1947	4,515	393	8·7
1948	4,464	293	6·6
1949	5,157	301	5·8
1950	5,324	285	5·3
1951	5,811	291	5·0
1952	5,804	298	5·1
1953	5,872	281	4·8
1954	5,115	287	5·6
1955	5,637	273	4·8
1956	5,497	203	3·7
Totals ...	53,196	2,905	5·5

The Adulteration of Milk in the County for each month of the year.

In table 10 will be found the figures for the number of milk samples submitted by County Sampling Officers during each month of the year together with the number adulterated and the percentage adulteration. In general the percentage adulteration usually increases during late winter and decreases in the autumn. The increasing adulteration of milk noted during the winter and first half of the year may be due to two factors: (*a*) the poorer quality of milk towards the end of the winter enables cases of slight adulteration to be detected more readily and, (*b*) the scarcity of milk in the winter may, in some instances, be an incentive to adulteration.

Table 10.

Milk.—Monthly Adulteration, 1956.

Month.	Number of Samples.	Number Adulterated.	Percentage of Adulteration.
January	557	25	4·5
February... ...	478	4	0·8
March ...	432	23	5·3
April	453	36	7·9
May	525	19	3·6
June	399	22	5·5
July	482	18	3·7
August	411	10	2·4
September ...	422	10	2·3
October	536	10	1·9
November ...	487	15	3·0
December ...	315	11	3·5
Total ...	5,497	203	3·7

In the following table will be found particulars of the various types of adulteration and the number of samples under each heading :—

Table 11.

			Per cent.
Milks deficient in fat only	105	*or*	1·91
Milks containing added water only	86	*or*	1·56
Milks deficient in fat and containing added water	10	*or*	0·19
Milks containing visible dirt	1	*or*	0·02
Milks containing fragments of broken glass ...	1	*or*	0·02
Milks containing preservatives	Nil	*or*	Nil
Milks containing colouring matter	Nil	*or*	Nil
	203	*or*	3·70
Milks containing more than 3 per cent. added water	34	*or*	0·62
Milks 10 per cent. or more deficient in fat ...	27	*or*	0·49

" Serious " and " Less Serious " Adulteration.

At first sight it may seem unjustifiable to speak of " serious " and " less serious " aspects of adulteration, for any adulteration of such an indispensable article of the diet as milk, must be regarded as serious. The figures, therefore, given in table 11 for adulteration include all samples which were found to be deficient in fat or which contained added water, irrespective of whether the deficiency or the added water was small, or great enough to justify a prosecution.

It has been the practice for some years now in these Reports, however, to attempt to distinguish between " serious " and " less serious " adulteration and since a useful purpose appears to be served by this classification it is continued this year. The general principle is to include under the term " serious," samples so grossly adulterated as to justify the institution of legal proceedings on analytical grounds and to class the rest, still adulterated, but not to so great an extent, under the term " less serious."

A study of table 11 reveals that 1·11 per cent. or less than one-third of the total milk adulteration may be considered " serious." This figure includes 34 samples which contained added water and 27 samples which were deficient in fat. A number of these seriously adulterated samples were taken informally and could not, therefore, be the subject of prosecutions. In several other instances corresponding appeal-to-cow samples of poor quality were submitted by the Sampling Officers. Prosecutions were recommended, however, in respect of 13 samples.

It will be noted that in addition to samples deficient in fat or containing water, there are two samples in table 11 one of which contained visible dirt and the other contained fragments of broken glass. These were informal samples of School Milk. The vendor of the sample that contained visible dirt (of the nature of carbon particles derived from paper ash) was cautioned and gave an assurance that all possible steps would be taken to eliminate the possibility of this occurring in future. With regard to the sample which contained fragments of broken glass, a prosecution under Section 2 of the Food and Drugs Act, 1955, was instituted against the vendor who was fined £25 and £11 11s. costs.

In table 12 are given details in regard to the adulterated milk samples submitted by County Sampling Officers, which were the subject of legal proceedings, together with the results of the prosecutions.

Table 12.

Milk Prosecutions, 1956.

Number of Sample.	Nature of Adulteration or Irregularity.	Observations.
C.5319	Deficient 5·8 per cent. solids-not-fat; freezing point indicated 5·3 per cent. extraneous water	Same vendor. Section 2 Food and Drugs Act, 1955. Fined £25 and £6 6s. costs.
C.5320	Deficient 14·9 per cent. solids-not-fat; freezing point indicated 14·3 per cent. extraneous water	
E.6756	Deficient 11·5 per cent. solids-not-fat; freezing point indicated 9·0 per cent. extraneous water	Same vendor. Section 2 Food and Drugs Act, 1955. Fined £20 and £7 7s. costs.
E.6757	Deficient 11·6 per cent. fat and 12·5 per cent. solids-not-fat; freezing point indicated 9·6 per cent. extraneous water	
C.5350	Deficient 8·3 per cent. fat and 18·9 per cent. solids-not-fat; freezing point indicated 21·5 per cent. extraneous water	Same vendor. Section 2 Food and Drugs Act, 1955. Conditional discharge on payment of £8 9s. 6d. costs.
C.5351	Deficient 10·9 per cent. solids-not-fat; freezing point indicated 11·6 per cent. extraneous water	
C.5352	Deficient 11·6 per cent. solids-not-fat; freezing point indicated 12·7 per cent. extraneous water	
S.6693	Deficient 12·8 per cent. solids-not-fat; freezing point indicated 11·9 per cent. extraneous water	Section 2 Food and Drugs Act, 1955. Fined £5 and £6 6s. costs.
C.5590	Deficient 33 per cent. fat	Section 2 Food and Drugs Act, 1955. Discharged on payment of £1 1s. costs.
N.5543	Contained numerous fragments of broken glass weighing in all 15·2 grammes.	Section 2 Food and Drugs Act, 1955. Fined £25 and £11 11s. costs.
N.6584	Deficient 13·4 per cent. solids-not-fat; freezing point indicated 12·5 per cent. extraneous water	Same vendor. Section 2 Food and Drugs Act, 1955. Fined £5 and £3 10s. costs.
N.6585	Deficient 11·7 per cent. solids-not-fat; freezing point indicated 11·4 per cent. extraneous water	
E.6576	Deficient 10·1 per cent. solids-not-fat; freezing point indicated 7·7 per cent. extraneous water	Section 2 Food and Drugs Act, 1955. Fined £2 and £1 1s. costs.

Adulteration of Milk : the County compared with Other Areas.

In the following table the percentage of milk adulteration for the year 1956 is given for a number of districts in England whose figures were available at the time of writing. The corresponding figure for the County of Lancaster was 3·7 per cent., as against 4·8 per cent. in the year 1955 and 5·6 per cent. in the year 1954. The percentage of milk adulteration in the County for the year under review is lower than the average (5·5 per cent.) for the areas included in the table. The rate of adulteration in these districts varied from 12·5 to 1·4 per cent.

Table 13.

Milk Adulteration, 1956. Various Districts.

Area.	Number of Samples.	Per cent. of Adult.	Area.	Number of Samples.	Per cent. of Adult.
Durham, County ...	960	1·9	Birmingham ...	2,880	8·0
Kent, County ...	1,583	3·9	Bristol	837	8·4
Somersetshire, County ...	1,857	6·8	Leeds	2,094	1·4
Staffordshire, County ...	3,971	2·6	Leicester	1,896	4·1
Surrey, County ...	705	3·0	Liverpool	3,156	3·3
Worcestershire, County ...	4,009	12·5	Manchester ...	1,236	10·7

Adulteration of Milk : England and Wales.

In table 14 there are set out the percentages of milk adulteration for the whole of England and Wales for a long period, 34 years, omitting the years of both wars, which are, unfortunately, not available. It will be seen that the figure for milk adulteration in the County, *i.e.*, 3·7 per cent. is lower than the average for the whole of England and Wales for the 34 years mentioned. In fact, in none of the years included in the table was the milk adulteration for England and Wales lower than that of the County for the year under review. Furthermore, this is the ninth time since the year 1940 that the figure for milk adulteration has fallen below the average for England and Wales for the years included in the table, the first time being in the year 1948 when the milk adulteration was 6·6 per cent.

Table 14.
Percentage of Milk Adulteration for England and Wales, 1900–1938.

Year.	Number Examined.	Number Adulterated.	Percentage of Adulteration.
*1900–1913 ...	569,916	62,318	10·9
1919	57,361	6,374	11·1
1920	62,463	5,797	9·3
1921	61,439	5,290	8·6
1922	60,274	4,624	7·7
1923	59,925	4,684	7·8
1924	62,133	4,773	7·7
1925	61,909	5,163	8·3
1926	62,507	4,625	7·4
1927	63,687	4,398	6·9
1928	67,350	5,542	8·2
1929	68,115	5,293	7·8
1930	69,311	4,581	6·6
1931	70,201	4,507	6·4
1932	72,940	5,307	7·3
1933	74,545	5,760	7·7
1934	76,930	5,506	7·2
1935	78,674	5,798	7·4
1936	80,082	5,706	7·1
1937	82,357	6,107	7·4
1938	80,025	6,141	7·7
Totals ...	1,942,144	168,294	8·7

* Figures for 1914–1918 and 1939—1956 inclusive, not available.

Milk.

General.

As in previous years the greater proportion of the samples submitted during the year consisted of milk ; the number of samples of milk was 5,497 out of a total number of samples submitted of 8,215.

The first impression created may be that the number of samples of milk seems unduly high as compared with the number of other samples. Taking into account, however, the fact that every day's production

represents a separate consignment probably delivered in bottles or churns any one of which might be adulterated and the others genuine, also the perishable nature of the commodity and the importance attached to milk as a food particularly for children, mothers and invalids, it is essential that adequate steps should be taken to ensure an unadulterated supply.

Such circumstances as these have led to the conclusion that, for the detection of adulteration and in order to safeguard the quality of daily supplies, it is advisable to take a relatively large proportion of samples of milk. In a memorandum issued by the Clerk of the Lancashire County Council, it is suggested that out of each 100 samples of food and drugs taken, about 60 should consist of milk.

The Standards of Quality for Milk.

In some countries there is a definite standard of quality required for liquid milk sold to the public ; it is then illegal to sell milk which is below that standard. In this country the law is less stringent. The present Food and Drugs Act contains no standards for milk. The position remains very much as it was before this Act came into operation, in that the one requirement laid down by law is that milk must be sold to each purchaser in the condition in which it came from the cow. If it attains a certain limit or exceeds it, it is to be regarded as above suspicion, and if it is below that limit it only becomes suspect, and it falls to the lot of the person who sold it to establish, if he can, before the Court that nothing has been added to it, or no ingredient abstracted from it.

In furtherance of the principle outlined in the preceding paragraph, presumptive limits for the composition of milk were established after exhaustive enquiries by a Government Committee appointed by the Board of Agriculture in 1900.

The outcome of the deliberations of this Committee was the production of the Sale of Milk Regulations, 1901, which were modified as regards skimmed milk in 1912. These Regulations were reproduced, in effect unaltered, in October 1939, in the Sale of Milk Regulations, 1939, made by the then Ministry of Agriculture and Fisheries. They are as follows :—

> (1) Where a sample of milk (not being milk sold as separated, or condensed, milk) contains less than 3 per cent. of milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1938, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-fat, or the addition thereto of water.
>
> (2) Where a sample of milk (not being milk sold as separated, or condensed, milk) contains less than 8·5 per cent of milk-solids other than milk-fat, it shall be presumed for the purposes of the

Food and Drugs Act, 1938, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-solids other than milk-fat, or the addition thereto of water.

(3) Where a sample of separated milk (not being condensed milk) contains less than 8·7 per cent. of milk-solids other than milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1938, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-solids other than milk-fat, or the addition thereto of water.

It will be seen from the above Regulations that no definite standard for milk is set up by them. They say, in effect, that a suspicion that adulteration may have been practised is to be entertained if either the fat falls below 3·0 per cent. or the non-fatty solids below 8·5 per cent. The very fact that failure to attain the limits only raises a presumption that milk is adulterated, means that it is admitted that a milk may be genuine, that is, not tampered with in any way, although it does not reach the figure for fat or solids-not-fat or both.

That is one side of the picture, a milk may be genuine so far as the law is concerned, and yet contain less than 3·0 per cent. of fat and 8·5 per cent. of solids-not-fat. Many milks, in fact most milks, however, have a composition well above 3·0 per cent. of fat. For instance, the average fat content of all the milks analysed in the County during the year was 3·71 per cent. Similarly the solids-not-fat are usually above 8·5 per cent., the average for the year being 8·59 per cent. The solids-not-fat may be considerably higher than the average figure just mentioned and an appreciable amount of water could then be added without bringing the solids-not-fat below the presumptive limit. For example, if a milk contained 9·3 per cent. of solids-not-fat it would be possible to add about 8·6 per cent. of water without the milk falling below the limit of the Sale of Milk Regulations. This possibility has been anticipated and provided for by Section 32 of the Food and Drugs Act, 1955, which re-enacts Section 24 of the 1938 Act, under which it is an offence to add water to milk (irrespective of the composition of the resulting mixture). The Hortvet Freezing Point Test enables the analyst to detect the presence and determine the amount of extraneous water in milk even in cases where the solids-not-fat have not been reduced below 8·5 per cent.

Channel Islands Milk and South Devon Milk.

In addition to the above standards of quality, which are applicable to all milk, a special standard for milk-fat content of not less than four per cent. was prescribed in the Milk (Great Britain) Order, 1954, for "Channel Islands Milk" and for "South Devon Milk." The enforcement of this standard was the responsibility of the Ministry of Agriculture, Fisheries and Food but during the year under review the Milk and

Dairies (Channel Islands and South Devon Milk) Regulations were made. These came into operation on the 1st July, 1956, and made food and drugs authorities responsible for enforcing the standard. "Channel Islands Milk" and "South Devon Milk" are defined by the Milk (Great Britain) Order, 1954, as amended, as being milk (*a*) which is produced from cows of the Channel Islands or South Devon Breeds and (*b*) which is labelled "Channel Islands Milk," "Jersey Milk," "Guernsey Milk" or "South Devon Milk" when sold in a container. This last Order also prescribes maximum prices for Channel Islands and South Devon Milk. The enforcement of the maximum price is still the responsibility of the Ministry of Agriculture, Fisheries and Food and Food and Drugs authorities are, therefore, requested to report to the Ministry details of any samples of Channel Islands and South Devon Milk sold at the higher price prescribed which are found to contain less than four per cent. of fat. This is, of course in addition to any enforcement action in regard to fat deficiency which the Food and Drugs authority may, itself, decide to take. During the year, 1956, 212 samples of Channel Islands Milk were examined (181 were submitted by County Sampling Officers and 31 by Autonomous Authorities). They were found upon analysis to have an average butter-fat content of 4·85 per cent., and an average solids-not-fat content of 9·04 per cent. Of the 212 samples examined 201 were satisfactory. Of the 11 unsatisfactory samples (nine County), Nos. S.6418, E.7044, E.7283, N.6048, S.7556 and N.6176 submitted by County Sampling Officers were found to have butter-fat contents of only 3·8, 3·3, 3·8, 3·9, 3·7 and 3·7 respectively and these results were brought to the notice of the Ministry of Agriculture, Fisheries and Food. Sample No. N.5868, also submitted by a County Sampling Officer, was found to have a butter-fat content of 3·9 per cent. but a follow-up sample taken in respect of this was found to be genuine. The two remaining County samples, Nos. E.7390 and N.6590, purchased from two different vendors, were found to have butter-fat contents of only 3·3 and 3·25 per cent. respectively. In addition, sample No. N.6590 was found to contain a small amount of extraneous water. Legal proceedings were successfully instituted against both the vendors who were fined £5 and £4 4s. costs and £2 and £4 18s. costs respectively. Two informal samples submitted by Autonomous Authorities were found to have butter-fat contents of 3·8 and 3·9 per cent. respectively and these results were also brought to the notice of the Ministry of Agriculture, Fisheries and Food.

The Average Composition of Milk during the Year.

Genuine milk has not always the same composition. There are natural variations in the amounts of both fat and solids-not-fat in milk as drawn from the cow. It therefore becomes a matter not only of interest but also of importance and significance, to know the average values for

these two constituents. This information is given for the year 1956 in table 15, where it will be seen that the average figures for fat are 3·71 per cent., for solids-not-fat 8·59 per cent., and for total solids 12·30 per cent.

It should be pointed out that the average compositions and frequencies included in this section of the Report are calculated from the results of all the samples of milk (other than Channel Islands milk) received ; that is to say, there are included all adulterated samples and further, all appeal-to-cow samples, whether they were above or below the limits for fat and solids-not-fat laid down by the Sale of Milk Regulations. The figures for average composition calculated on this basis will, therefore, tend to be somewhat lower than those for genuine milk sold in the County.

Table 15.

Average Composition of Milk, 1956.

Month.	Number of Samples.*	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
January ...	557	3·65	8·56	12·21
February ...	1,468 — 478	3·64 — 3·65	8·56 — 8·58	12·20 — 12·23
March ...	433	3·62	8·54	12·16
April	459	3·61	8·52	12·13
May	1,387 — 529	3·59 — 3·59	8·58 — 8·58	12·17 — 12·17
June	399	3·55	8·64	12·19
July	491	3·64	8·60	12·24
August ...	1,324 — 411	3·72 — 3·75	8·61 — 8·60	12·33 — 12·35
September ...	422	3·80	8·62	12·42
October ...	542	3·89	8·66	12·55
November ...	1,345 — 487	3·87 — 3·92	8·63 — 8·65	12·50 — 12·57
December ...	316	3·76	8·54	12·30
Whole year ...	5,524	3·71	8·59	12·30

* Includes Appeal-to-Cow samples.

The Average Composition of Milk for each Month of the Year.

Table 15 also includes the figures for the averages of fat and solids-not-fat for each month of the year. As regards fat it will be seen that June has the lowest figure, 3·55 per cent., and November the highest, 3·92 per cent. In respect of solids-not-fat, the lowest figure was obtained

in April, 8·52 per cent., the highest in October, the figure then being 8·66 per cent. These variations, particularly in respect of fat content, have been the general experience for many years, the fat content usually being at its lowest in the spring and at its highest in the autumn. Solids-not-fat tend to be lower in the early months of the year.

The Average Composition of Morning and Evening Milk during the Year.

Usually, when samples are submitted, the information is given whether they are morning or evening milks. It has, therefore, been possible to classify them so as to show the average composition of morning and evening milks separately.

When cows are milked at the usual intervals the evening milk, due to the shorter interval, is richer in fat than the morning milk, while there is little if any difference as a rule in solids-not-fat. This is illustrated in table 16 below, where the average fat for morning milk is 3·61 per cent., and the evening fat 4·08 per cent. ; the fat in the evening milk being greater by 0·47 per cent., while the averages for solids-not-fat are almost identical for the morning and evening milk.

Table 16.

The Average Composition of Morning and Evening Milk during the Year.

	Number of Samples.*	Fat per cent.	Solids-not-fat per cent.	Total solids per cent.
Morning Milk ...	1,176	3·61	8·59	12·20
Evening Milk ...	772	4·08	8·63	12·71
Mixed Milk ...	183	3·67	8·54	12·21
Unknown ...	3,393	3·65	8·59	12·24
Total ...	5,524	3·71	8·59	12·30

* Includes Appeal-to-Cow samples.

The Average Composition of Milk : compared with past years.

In table 17 the average composition of all the milks examined is set out for the period 1910-1956. It will be seen that the average figure for fat does not vary greatly from year to year. In respect of solids-not-fat there is very little difference in the averages for the years 1910-1940. Since 1940, however, it will be noted there is an appreciable decrease in solids-not-fat, the lowest figure of 8·55 per cent. being obtained in the year 1943. The average for solids-not-fat for the year under review was 8·59 per cent. In addition to other possible causes for this decrease it should be remembered, however, that seven of the 16 years during which the average solids-not-fat have been lower than formerly were years which showed a high rate of adulteration. Since the year 1943 there has been in general a tendency for solids-not-fat to show an upward trend but they are still appreciably below the pre-war figures ; the solids-not-fat

for the year under review, in particular, again being low compared with the figures for the last few years and only of the order of the averages obtained at the end of the war.

Table 17.

Average Composition of Milk, 1910–1956.

Year.	Number of Samples.	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
1910 to 1930 ...	56,028	3·67	8·90	12·57
1931	3,090	3·84	8·81	12·65
1932	3,205	3·77	8·85	12·62
1933	3,060	3·76	8·82	12·58
1934	3,310	3·74	8·81	12·55
1935	3,422	3·75	8·84	12·59
1936	3,098	3·73	8·88	12·61
1937	3,278	3·74	8·84	12·58
1938	3,398	3·70	8·78	12·48
1939	3,128	3·67	8·78	12·45
1940	2,144	3·70	8·79	12·49
1941	1,866	3·70	8·64	12·34
1942	1,516	3·75	8·66	12·41
1943	1,489	3·70	8·55	12·25
1944	1,197	3·69	8·57	12·26
1945	1,096	3·72	8·57	12·29
1946	2,776	3·75	8·58	12·33
1947	4,625	3·75	8·63	12·38
1948	4,523	3·67	8·64	12·31
1949	5,210	3·66	8·65	12·31
1950	5,362	3·68	8·67	12·35
1951	5,839	3·67	8·65	12·32
1952	5,844	3·67	8·68	12·35
1953	5,922	3·68	8·68	12·36
1954	5,182	3·71	8·65	12·36
1955	5,686	3·68	8·66	12·34
1956	5,524	3·71	8·59	12·30
1910 to 1956 ...	150,818	3·72	8·83	12·55

Composition of Milk : the County compared with Other Areas.

In table 18 below, figures are given for the composition of milk during the year 1956 in the areas of 12 other Food and Drugs Authorities. The corresponding figures for the County of Lancaster, based upon 5,524 samples of milk, are fat 3·71 per cent., solids-not-fat 8·59 per cent., and total solids 12·30 per cent. The figure for fat compares favourably with that in other areas. In respect of solids-not-fat, however, the position is not quite so satisfactory, the Lancashire figure being below the average (8·76 per cent.) of those included in the table.

Table 18.

Composition of Milk, 1956. Various Districts.

Area.	Number of Samples.	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
Durham, County ...	960	3·72	8·70	12·42
Somersetshire, County ...	1,924	3·91	8·86	12·77
Staffordshire, County ...	4,113	3·65	8·69	12·34
Surrey, County	718	4·15	8·95	13·10
Worcestershire, County	4,055	3·68	8·73	12·41
Birmingham	2,880	3·67	8·75	12·42
Leeds	2,096	3·67	8·77	12·44
Leicester	1,896	3·68	8·72	12·40
Liverpool	3,156	3·63	8·74	12·37
Manchester	1,236	3·50	8·71	12·21
Portsmouth	707	3·87	8·70	12·57
Salford	703	3·64	8·82	12·46

The Composition of Milk : Frequencies.

The 5,524 samples of milk reported upon during the year have been arranged in table 19 to show the number of samples having the same percentage of fat, or, in other words, the frequency with which each percentage of fat, differing by 0·1 per cent., occurred. The table has been shortened by placing in separate groups all samples containing less than 2·5 per cent. and above 3·9 per cent. This information is given for the whole year and for each month of the year.

This table gives different information than do figures for averages. It shows that, as in previous years, there are comparatively few samples below 3·0 per cent. It also shows how the figures from which the averages are calculated are distributed, information which is not obtainable from the figures for averages alone.

In this table, and the following one, table 20, all samples of milk are included, whether adulterated or not, and also all appeal-to-cow samples.

Table 19.

Composition of Milk : Frequencies.

FAT.

Per cent.	Number of Samples.												
	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Under 2·5	0	0	0	3	1	0	2	1	0	0	0	0	7
2·5	0	0	0	1	0	1	4	0	0	1	1	0	8
2·6	3	0	0	2	0	0	1	0	0	0	1	0	7
2·7	3	0	4	3	2	2	5	0	2	2	1	0	24
2·8	3	1	4	4	1	8	3	1	1	3	1	0	30
2·9	4	1	4	10	9	7	5	2	4	1	2	2	51
3·0	17	7	14	15	13	13	17	2	9	3	2	4	116
3·1	10	14	9	13	12	17	10	6	8	0	6	4	109
3·2	13	11	13	18	23	15	12	11	8	11	7	13	155
3·3	25	14	21	32	75	37	30	13	12	10	9	17	295
3·4	44	38	58	54	101	82	55	30	14	11	12	13	512
3·5	103	101	121	93	89	72	86	54	33	17	14	22	805
3·6	146	134	81	66	67	41	94	75	36	47	29	33	849
3·7	68	58	29	32	43	23	45	74	98	111	56	65	702
3·8	34	23	9	28	17	20	22	50	76	122	104	78	583
3·9	18	14	14	14	11	15	23	21	24	68	98	16	336
4·0 and over ..	66	62	52	71	65	46	77	71	97	135	144	49	935
Totals ..	557	478	433	459	529	399	491	411	422	542	487	316	5,524

Table 20 gives the frequencies for solids-not-fat. It has already been stated that the average figure for solids-not-fat for the year was 8·59 per cent., and the bulk of the individual figures for solids-not-fat are arranged closely around the average.

Table 20.

Composition of Milk : Frequencies.

SOLIDS-NOT-FAT.

Per cent.	Number of Samples.												
	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Under 7·8	1	1	2	11	1	0	0	0	0	0	2	2	20
7·8	2	0	0	0	0	0	0	0	0	0	2	0	4
7·9	1	1	1	1	0	0	1	0	0	1	0	0	6
8·0	2	1	1	3	2	0	1	1	1	4	2	4	22
8·1	9	2	9	10	4	2	3	2	1	3	1	3	49
8·2	12	8	7	17	5	5	7	4	2	6	2	10	85
8·3	25	13	22	25	23	8	18	18	13	9	13	17	204
8·4	46	31	49	38	31	18	36	39	22	13	10	19	352
8·5	215	186	193	191	198	93	140	147	129	81	109	141	1,823
8·6	153	139	78	84	145	121	148	72	109	182	148	76	1,455
8·7	41	51	37	38	71	84	86	68	88	127	118	29	838
8·8	34	28	19	24	29	39	29	39	34	83	42	7	407
8·9	9	12	9	10	10	20	14	15	15	18	21	5	158
9·0 and over	7	5	6	7	10	9	8	6	8	15	17	3	101
Totals ..	557	478	433	459	529	399	491	411	422	542	487	316	5,524

Samples of Milk taken for Comparison.

Part II of the Seventh Schedule of the Food and Drugs Act, 1955, contains certain provisions relating to the procuring of comparison samples of milk. Briefly, when a sample of milk is obtained from a vendor he must, if so requested, give to the Sampling Officer the name and address of the person from whom he, in turn, received the milk. The vendor may also, within 60 hours of the sample being taken, serve on the Food and Drugs Authority a notice stating the name and address of the person from whom he received the milk and the time and place of delivery to himself of milk from a corresponding milking, and requesting the Authority to procure, as soon as practicable, a sample of milk from a corresponding milking in course of transit or delivery to himself. The vendor shall have no right to request such a sample if the original sample procured from him was a mixture of milk produced on more than one dairy farm. In turn, the dairyman from whom such a sample of milk is procured in course of transit or delivery, may, within 60 hours after the sample was procured, serve on the Authority concerned a notice requesting

that immediate steps be taken to procure a sample of milk from a corresponding milking of the cows. The person procuring this last sample shall be empowered to take such steps at the dairy as may be necessary to satisfy him that the sample is a fair sample of the milk of the cows when properly and fully milked.

It is the practice in the County for the Sampling Officers to take, in appropriate cases, follow-up and appeal-to-cow samples without a formal request being made by the vendor. This involves a considerable amount of work both for the Sampling Officers and the Analyst. Sometimes both types of samples are obtained and as many as six and occasionally even 12 samples may be taken in connection with one unsatisfactory sample. It is thought desirable to undertake this large amount of work to ensure that everything possible is done to establish beyond all reasonable doubt that a sample is adulterated and not of naturally poor quality and, if adulterated, to obtain information indicating where the adulteration occurred before deciding whether legal proceedings should be instituted.

Appeal-to-Cow Samples.

Appeal-to-cow samples, or, as they are sometimes called, " byre " samples, if the method of taking them is properly carried out in every detail, may be regarded in the light of a final appeal. The milking must be carefully supervised, it must be established that the same cows are milked, that it is the corresponding milking and the dairy equipment must be inspected to see that it is clean and dry. The results of analysis of samples procured in this way must be accepted as those pertaining to genuine milk. Appeal-to-cow samples serve at least two purposes. In the first place, they show, in cases where an unsatisfactory sample has been sold, the quality of the unadulterated milk given by the cows, and, secondly, extend our knowledge of the quality of the milk of different herds and of the natural variations which may occur in the composition of genuine milk.

It was with the former object in view that the practice of taking appeal-to-cow samples was instituted, *viz.*, to ascertain the composition of the milk given by the cows. It is now generally admitted that the composition of the milk from a herd of cows may occasionally fall below the limits laid down in the Sale of Milk Regulations, particularly at the morning milking. When such a milk is examined the question arises whether it is an unadulterated milk of poor quality, or a milk of normal composition which has been tampered with ; the appeal-to-cow sample is intended to help to solve this problem.

In table 21, there is given a list of appeal-to-cow samples, submitted by County Sampling Officers during the year 1956, and also the results of analysis. Twenty-seven such samples are included, representing nine herds, the number of cows in the herds varying from seven to 34.

In addition eleven appeal-to-cow samples were examined for autonomous authorities.

Table 21.

Analysis of Appeal-to-Cow Samples of Milk.

Number	Number of Cows Milked.	Approximate yield, gallons.	Morning or Evening.	Fat per cent.	Solids-not-fat per cent.	Freezing Point (Hortvet) °C.	Taken for comparison with numbers	Observations.
373	14	11	E	4·45	8·23	—0·540	E.6576	Low in solids-not-fat.
375		10		3·40	8·50	—0·538	E.6756	
376	18	10½	M	3·60	8·50	—0·540	and	
377		10		2·80	8·40	—0·543	E.6757	Poor in fat and slightly low in solids-not-fat.
S.6714	6	6		2·90	8·32	—0·534		Poor in fat and low in solids-not-fat.
S.6715	7	4	M	2·30	8·94	—0·537	S.6697	Poor in fat.
S.6716	1	1		2·67	8·91	—0·538		Poor in fat.
438	5			3·32	8·78	—0·543		
439	3	12	M	3·35	9·07	—0·545	C.5590	
440	3			3 37	8·67	—0·543		
441	2			3·22	8·82	—0·544		
S.7247	5	9	M	3·12	8·70	—0·543	S.7243	
S.7248	2	3½		2·92	8·96	—0·543		Poor in fat.
378		4		2·70	8·72	—0·538		Poor in fat.
379		7		2·50	8·84	—0·541		Poor in fat.
380	18	5	M	2·60	8·84	—0·542	E.7339	Poor in fat.
381		5½		2·55	8·79	—0·541	E.7340	Poor in fat.
382		4		2·75	8·25	—0·540		Poor in fat and low in solids-not-fat.
383	8	10	M	2·90	8·38	—0·535		Poor in fat and low in solids-not-fat.
384		10		3·00	8·56	—0·539		
442		12		3·95	8·57	—0·539		
443		12		3·40	8·46	—0·537		Slightly low in solids-not-fat.
444	34	11	M	3·25	8·41	—0·539	C.6434	Slightly low in solids-not-fat.
445		12		3·00	8·24	—0·539		Low in solids-not-fat.
446		12		3·20	8·22	—0·539		Low in solids-not-fat.
447		12		3·00	8·40	—0·539		Slightly low in solids-not-fat.
465	14	9½	E	4·25	8·27	—0·533	N.6585	Low in solids-not-fat

An inspection of table 21 shows that the freezing point depression of the appeal-to-cow samples was determined in every case, and this gave valuable evidence of the authenticity of the samples. Although, as

indicated in the next paragraph, a number of the appeal-to-cow samples were naturally poor in solids-not-fat, in no such instance was the freezing point of the sample above —0·530°C. (Hortvet), the figure which is usually accepted as the highest freezing point given by milk free from extraneous water. The freezing points of the 27 appeal-to-cow samples varied between —0·533°C. (Hortvet) to —0·545°C. (Hortvet); the average figure being —0·539°C. (Hortvet). The average freezing points of appeal-to-cow samples examined during the five preceding years were —0·539°C., —0·539°C., —0·540°C., —0·540°C. and —0·540°C.

A further examination of the results in table 21 makes it obvious that some of the samples did not attain the presumptive limits of 3·0 per cent. for fat and 8·5 per cent. for solids-not-fat laid down by the Sale of Milk Regulations, 1939. In this respect 11 samples contained less than 3·0 per cent. fat and 11 samples contained less than 8·5 per cent. solids-not-fat. It must be remembered, however, that the appeal-to-cow samples listed in the above table were all taken in connection with previous samples of milk which were either adulterated or of unsatisfactory quality; in other words, the high proportion of poor quality appeal-to-cow samples obtained is due to selective sampling and it cannot, therefore, be assumed that the results are indicative of the general quality of milk in Lancashire.

In tables 22 and 23 will be found the analytical results obtained in respect of the 27 appeal-to-cow samples, submitted by County Sampling Officers, arranged to show their frequencies in respect of fat content and solids-not-fat.

Table 22.

Appeal-to-Cow Samples.—Frequencies.

FAT.

Per cent.	Number of Samples.	Percentage of Total Samples.
2·3	1	3·7
2·5	2	7·4
2·6	2	7·4
2·7	2	7·4
2·8	1	3·7
2·9	3	11·1
3·0	3	11·1
3·1	1	3·8
3·2	3	11·1

Table 22—continued.

Per cent.	Number of Samples.	Percentage of Total Samples.
3·3	3	11·1
3·4	2	7·4
3·6	1	3·7
3·9	1	3·7
4·2	1	3·7
4·4	1	3·7
Total ...	27	100·0

Table 23.

Appeal-to-Cow Samples.—Frequencies.

Solids-not-Fat.

Per cent.	Number of Samples.	Percentage of Total Samples.
8·2	5	18·6
8·3	2	7·4
8·4	4	14·8
8·5	4	14·8
8·6	1	3·7
8·7	4	14·8
8·8	3	11·1
8·9	3	11·1
9·0	1	3·7
Total ...	27	100·0

Milk Supplied to Schools, Day Nurseries, Children's Homes and Hostels for the Aged.

The 318 samples of milk marked " Private " in table 3 were taken from consignments delivered to Schools, Day Nurseries, Children's Homes and Hostels for the Aged in the County. Seventeen of these samples were adulterated, corresponding to an adulteration rate of 5·3 per cent. This figure is higher than the total milk adulteration rate for the County which was 3·7 per cent.

Of the 318 samples 297 were taken at Schools. Seventeen of these were found to be adulterated or otherwise unsatisfactory. Repeat samples taken in respect of 13 of these samples were found to be satisfactory. Two samples showed only slight fat deficiencies and the respective vendors were notified of the results. The two remaining samples both contained extraneous matter. Sample No. S.6455 contained traces of visible dirt (of the nature of carbon particles derived from paper ash). The vendor was cautioned and gave an assurance that all possible steps would be taken to eliminate the possibility of this occurring in future. Sample No. N.5543 was found to contain fragments of broken glass and a prosecution under Section 2 of the Food and Drugs Act, 1955, was instituted against the vendor who was fined £25 and £11 11s. costs.

With regard to the 21 remaining samples, 13 were taken at Day Nurseries, three at Children's Homes and five at Hostels for the Aged. All these samples were found to be satisfactory.

Samples of Milk deficient in solids-not-fat but genuine.

Attention has already been drawn, in the sections of this Report dealing with the " Standards of quality for milk " and " appeal-to-cow " samples, to the fact that milk as it comes from the cow is not always of such quality as to comply with the minimum presumptive limits of 3·0 per cent. for milk-fat and 8·5 per cent. for solids-not-fat, of the Sale of Milk Regulations, 1939. In order to decide whether such samples submitted under the Food and Drugs Act were in fact as given by the cow, and therefore, genuine, it is still necessary in the case of presumed fat deficiencies to make an actual comparison with an " appeal-to-cow " sample from a corresponding milking. Formerly, this was also the only means by which it could be decided whether a sample low in solids-not-fat was of naturally poor quality or whether it had been adulterated by the addition of water. For the past 25 years or so, however, it has been possible by submitting the sample to the Hortvet freezing point test for the Analyst to obtain additional evidence that a deficiency in solids-not-fat was due to the presence of extraneous water or, alternatively, that it was due to natural causes.

In the section of the revised Ministry of Health memorandum 36/Foods (1939), dealing with Public Analysts' quarterly reports, it is laid down that in the case of samples below the presumptive limits of the Sale of Milk Regulations, the report should show whether they were adjudged genuine by the Analyst on other grounds. It is now the normal procedure to submit all samples low in solids-not-fat to the Hortvet freezing point test and to include in the quarterly reports a table giving details of such samples which satisfactorily pass the test.

During the year under review, 619 County samples of milk were found be poor in solids-not-fat, but were adjudged genuine by the Hortvet freezing point test. This figure corresponds to 11·2 per cent. of the total milk samples (including appeal-to-cow) submitted by County Sampling Officers. These poor quality milks were distributed over the year as follows :—203 in the March quarter, 169 in the June quarter, 147 in the September quarter and 100 in the December quarter. The samples were not, therefore, confined to any particular season of the year, although the greatest number was obtained towards the end of the winter and the lowest in the autumn. The lowest figure for solids-not-fat shown by any of these samples was 7·70 per cent., the next lowest being 7·90 per cent.

Each year it is usual to find an appreciable number of milk samples which are poor in solids-not-fat but are nevertheless adjudged genuine as the result of applying the Hortvet freezing point test. The number of such samples, *viz.*, 11·2 per cent., submitted during the year under review is higher by 4·7 per cent. than for the year 1955, when the figure was 6·5 per cent. In the five years preceding the year 1955 the percentage of milk samples coming under this heading varied from 3·8 to 7·9 per cent.

It will be noted that the percentage of milk samples poor in solids-not-fat but genuine by the freezing point test for the year 1956, *viz.*, 11·2 per cent. is also proportionately very high when compared with the percentage of adulterated milk samples for the same year, *viz.*, 3·7 per cent. The difference is even more striking when it is considered that the last mentioned figure includes all samples containing extraneous water and all samples containing less than 3·0 per cent. milk fat whether or not, in the latter instance, the corresponding appeal-to-cow samples indicated that the fat deficiences were actually due to abstraction or only to natural causes.

Adulteration of Articles other than Milk.

During the year under review there were examined for the County 2,718 samples other than milk ; of these 137 were reported against, which corresponds to an adulteration rate of 5·0 per cent., which is slightly lower than the figure obtained in the year 1955, when it was 5·1 per cent. The percentage of adulteration in articles other than milk for the year under review, was much higher than that for milk, *viz.*, 3·7 per cent. An examination of tables 3 and 24 shows that the commodities which had a relatively high proportion of unsatisfactory samples, and, therefore, contributed especially to the overall adulteration rate, included fish paste, flour, ice-cream, sausages and samples whose labels did not conform to the requirements of the Labelling of Food Order.

Table 24 gives a list of the articles other than milk submitted by County Sampling Officers which were found to be unsatisfactory with particulars of the type of adulteration and the action taken.

Table 24.

Samples, other than Milk, Adulterated or otherwise giving rise to Irregularity.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
C.4776 ..	Rose Hip Syrup ..	Informal	Labelling of Food Order, paragraph 9 and the 2nd Schedule require declaration in terms of milligrams of Vitamin C per ounce (not per 100 ml.).	Old stock. Correct labels now in use. Same packer as sample No. E.6193.
E.6193 ..	Rose Hip Syrup ..	Informal	Labelling of Food Order, paragraph 9 and the 2nd Schedule require declaration in terms of milligrams of Vitamin C per ounce (not per 100 ml.)	See sample No. C.4776.
N.4927 ..	Glycerin ..	Informal	Contained 0·3 per cent. excess water.	No action advised.
N.4913 ..	Pineapple Drink ..	Informal	Should be labelled "Pineapple Drink—ready for use." List of ingredients incomplete and the words "pure fruit juice" appears alone on part of the label.	Packers agreed to alter labels.
E.6250 ..	Health Food ..	Informal	Iron content only 3·5 mgms. per ounce. Calcium content only 80 mgms. per ounce. Declared 9 and 540 mgms. per ounce respectively.	Packers took steps to prevent any similar discrepancy in future.
E.6301 ..	Glycerin ..	Informal	Contained 0·7 per cent. excess water.	No action advised.
N.4957 ..	Apples ..	Informal	Contained lead 4·5 parts per million and arsenic 1·2 parts per million.	Shippers, Port Health Authority and Ministry of Agriculture, Fisheries and Food notified.
E.6343 ..	Glycerin ..	Informal	Contained 0·4 per cent. excess water.	No action advised.
N.4970 ..	Pork Sausage	Informal	Contained 110 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration and meat content only 53·5 per cent.	Vendor cautioned.
N.4993 ..	Apples ..	Informal	Contained lead 5·6 parts per million and arsenic 1·4 parts per million.	Same source as sample No. N.4957.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
N.4974 ..	Flour, Plain ..	Informal	Contained only 7 ounces of creta praeparata per 280 lbs. and only 1·05 mgms. of iron and 0·15 mgms. of Vitamin B1 per 100 grams.	Ministry of Agriculture, Fisheries and Food informed.
N.4998 ..	Milk Bread ..	Informal	Milk equivalent to not more than 0·4 per cent. skimmed milk powder in the flour used.	Vendor interviewed. Sold as Milk Bread in error.
S.6291 ..	Flour, Plain ..	Informal	Contained only 7·1 ounces of creta praeparata per 280 lbs. but Vitamin B1 and iron contents satisfactory.	No action advised.
E.6457 ..	Peas, Dried ..	Informal	Steeping tablet contained synthetic colouring matters which were not included in the list of ingredients.	Packers gave an assurance that all existing stocks in their hands would be overprinted to comply with the requirements of the Labelling of Food Order.
N.5060 ..	Vinegar ..	Informal	Contained 1·2 per cent. salt without this being disclosed in list of ingredients.	Packers agreed to alter labels.
C.5059 ..	Ox Tongue Spread ..	Informal	Meat content only 50·5 per cent.	Packers undertook to take steps to prevent a similar occurrence in future.
E.6519 ..	Lemon Flavoured Crystals ..	Informal	Sample moist and caked and contained saponin.	Old stock. Remainder of stock withdrawn from sale.
N.5126 ..	Gelatine ..	Informal	Ash 4·4 per cent. should not exceed 3·25 per cent.	Old stock. Remainder of stock disposed of.
N.5144 ..	Pork Sausage	Informal	Meat content 54 per cent.	Vendor interviewed.
S.6418 ..	Channel Islands Milk ..	Formal ..	Fat content only 3·8 per cent.	Ministry of Agriculture Fisheries and Food informed.
C.5145 ..	Pork Luncheon Meat, Canned	Informal	Contained only 86·5 per cent. pork. Declared 90 per cent. pork.	No action advised.
E.6610 ..	Pork Luncheon meat, Canned	Informal	Contained only 85 per cent. pork. Declared 90 per cent. pork.	No action advised.
C.5186 ..	Pork Sausage	Informal	Meat content 59·5 per cent.	Vendor interviewed.
N.5216 ..	Pork Sausage	Informal	Meat content 56·5 per cent.	Vendor interviewd.
N.5265 ..	Boric Ointment ..	Informal	Contained 9·8 per cent. Boric Acid. Consisted of Ointment of Boric Acid B.P. 1932.	Old stock. No further stock available.
S.6504 ..	Flour	Informal	Contained only 9·1 ounces of creta praeparata per 280 lbs. but Vitamin B1 and iron contents satisfactory.	No action advised.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.6687 ..	Creamed .. Mushrooms, Canned	Informal	Total fat in sample 4·6 per cent. Butter-fat in sample only 0·1 per cent. Claims of milk (as distinct from skimmed milk) and butter in order given in list of ingredients not justified.	Packers agreed to alter labels.
C.5310 ..	Margarine ..	Private .. (Day Nursery)	Wrapper did not bear the word "Margarine" as required by Labelling of Food (Amendment) Regulations, 1955.	Packers agreed to alter labels.
E.6789 ..	Pork Sausage	Informal	Meat content 57·5 per cent.	Vendor interviewed.
E.6790 ..	Pork Sausage	Informal	Meat content 60·5 per cent.	Vendor interviewed.
E.6819 ..	Beef Sausage ..	Informal	Contained 225 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed.
1 ..	Opened can .. of Cut Celery (approx. half full)	Informal	Contained a piece of chewing gum.	Packers cautioned.
N.5386 ..	Fruit Curd .. (Lemon Cheese)	Informal	Words "New laid eggs" should not precede the word "sugar" in declaration on label.	Packer agreed to bear in mind the correct order of ingredients when new labels are printed.
C.5429 ..	Pork Sausage	Informal	Meat content 59 per cent.	Vendor communicated with.
C.5471 ..	Rose Hip .. Syrup	Informal	Labelling of Food Order, paragraph 9 and the 2nd Schedule require declaration in terms of milligrams of vitamin C per fluid ounce (not per 100 ml.)	Old stock. Correct labels now in use.
N.5457 ..	Amphetamine Inhaler	Informal	Inhaler contained only 0·146 gram amphetamine compared with 0·330 gram declared.	See no. N.5627.
E.6897 ..	Glycerin of .. Thymol B.P.C.	Informal	Two Bottles :— .. (1) Glycerin 2·6 per cent. w/w. (2) Glycerin 11·0 per cent. w/w. Should be Glycerin 12·0 per cent. w/w.	Packers undertook to prevent a recurrence in future.
E.6994 ..	Pickled .. Herrings in Fresh Lemon Juice, Bottled	Informal	Sample contained 5 per cent. Lemon Juice, 3·1 per cent. Salt, 0·03 per cent. saccharin and no vitamin C. Ingredients in wrong order and lemon juice should not be described as fresh.	Packers agreed to alter labels.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
C.5575 ..	Ammoniated .. Tinture of Quinine	Informal	Ammonia 0·75 per cent. w /v Deficient of 0·10 per cent. of the minimum amount of ammonia.	Stock withdrawn from sale.
C.5574 ..	Soluble Aspirin Tablets (for children) raspberry flavoured	Informal	Free salicylic acid present equal to eleven times the B.P. maximum limit.	Stock withdrawn from sale.
C.5578 ..	Ice-cream ..	Informal	Fat content only 3·6 per cent.	Formal sample genuine.
E.7033 ..	Tincture of .. Iodine	Informal	Iodine 0·4 per cent. and Potassium Iodide 0·5 per cent. above maximum B.P. limit. Bottle only part-full and alcohol content only 75 per cent. v /v compared with B.P. 85–88 per cent. v /v.	Vendor interviewed. Remainder of stock returned to manufacturers.
E.7044 ..	Channel .. Islands Milk	Formal ..	Fat content 3·3 per cent.	Ministry of Agriculture, Fisheries and Food informed.
N.5627 ..	Amphetamine Inhaler	Informal	Contained only 0·147 gram Amphetamine, declared to contain 0·330 gram.	Old stock.
E.7103 ..	Fruit Curd .. (Lemon Cheese)	Informal	Soluble solids 63·8 per cent. Deficient 1·2 per cent. soluble solids.	Packers took steps to prevent a recurrence in future. Remainder of stock withdrawn from sale.
M.6965 ..	Part Brown .. Loaf (sliced)	Informal	Contained 32 pieces of rusty fine iron turnings weighing in all 0·21 gram.	Referred to Food and Drugs Authority of vendor's area.
C.5691 ..	Quinine Tonic Water	Informal	Contained only 0·39 grains quinine sulphate B.P. per pint instead of 0·5 grains per pint required by the Soft Drinks Order, 1953.	Packers communicated with.
C.5731 ..	Ginger, .. Ground	Informal	Ash 9·06 per cent. Sand, etc 2·82 per ecnt. Ash above B.P. limit of 6·0 per cent. mainly due to presence of sand and other acid insoluble matter.	Packers asked to take steps to prevent a recurrence.
N.5755 ..	Ice-Cream ..	Informal	Fat content only 4 per cent.	Vendor cautioned. Further sample genuine.
N.5776 ..	Malt Extract .. with Cod Liver Oil	Informal	Acid value of oil 60 and no name and address of packer on label.	Stock withdrawn from sale. Packers communicated with.
N.5778 ..	Malt Extract .. with Cod Liver Oil	Informal	Protein 3·3 per cent. equivalent to 3·7 per cent. in the original malt extract used.	Manufacturers communicated with. Stock withdrawn from sale.
E.7195 ..	Cream Cheese	Informal	Fat 13·5 per cent. Moisture 71·6 per cent. Consisted of curd or sour milk cheese and not cream cheese.	Vendor cautioned.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
S.7154 ..	Cheese Spread	Informal	Fat content only 18·5 per cent. Cheese Spread should contain at least 20 per cent. milk-fat.	Packers agreed to maintain a 20 per cent. milk-fat content in future.
E.7283 ..	Channel .. Islands Milk	Formal ..	Fat content only 3·8 per cent.	Vendor cautioned. Ministry of Agriculture, Fisheries and Food informed.
E.7286 ..	Pork Sausage	Informal	Meat content only 58 per. cent. Contained 240 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor interviewed and cautioned.
N.5868 ..	Channel .. Islands Milk	Formal ..	Fat content only 3·9 per cent	Vendor cautioned. Further sample genuine.
E.7305 ..	Flour	Informal	Contained only 1·7 ounces Creta Praeparata per 280 lbs sack and only 0·8 mgm.of Iron per 100 grams	Ministry of Agriculture, Fisheries and Food informed.
E.3707 ..	Custard Tart, Part of	Informal	Contained a piece of two-ply twine four and three-quarters of an inch long	Vendor cautioned.
E.7321 ..	Pork Sausage	Informal	Contained 420 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor interviewed and cautioned.
E.7322 ..	Beef Sausage ..	Informal	Contained 110 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor interviewed and cautioned.
E.7326 ..	Vitaminised .. Sweets	Informal	Vitamin contents should be declared per ounce and not per 10 dragees, also Vitamin B_1 should be declared in mgms. and not I.U's.	Packers agreed to alter label.
E.7352 ..	Double Cream	Informal	Fat content only 43·8 per cent.	No further stock available.
S.7263 ..	Borax, .. Concentrated	Informal	Described on label as " Prepared Concentrated Borax." Consisted of ordinary borax	Packers requested to take immediate steps to alter label.
S.7268 ..	Table Jelly .. Crystals	Informal	Fruit content in finished Jelly Table Sweet not more than 0·3 per cent.	Old stock. Packers already agreed to alter label.
E.7390 ..	Channel .. Islands Milk	Formal ..	Deficient 17·5 per cent. fat.	Milk and Dairies (Channel Islands and South Devon Milk) Regulations, 1956. Fined £5 and £4 4s. costs.
N.5974 ..	Pork Sausage	Informal	Meat content 62 per cent. ..	-Vendor interviewed.

Table 24 continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.7430 ..	Sago	Informal	Consisted of Tapioca ..	Vendor communicated with.
E.7456 ..	Sago	Informal	Consisted of Tapioca ..	Vendor communicated with.
N.6001 ..	Seidlitz .. Powders, Double Strength	Informal	Consisted of ordinary strength seidlitz powders	Vendor cautioned.
E.7483 ..	Dripping ..	Informal	Contained Free Fatty Acids 2·0 per cent. Should not be more than 1·5 per cent.	Vendor communicated with.
E.7487 ..	Salmon Paste	Informal	Consisted of Fish Paste made with white fish	See No. E.7523.
S.7420 ..	Cocoa ..	Informal	Sample contained several live and dead beetles (niptus hololeucus) larvae and eggs	Stock surrendered for destruction.
E.7523 ..	Salmon Paste	Formal ..	Consisted of Fish Paste prepared from white fish	Section 2 Food and Drugs Act, 1955. Fined £5 and £5 19s. costs.
S.7411 ..	Blanc Mange .. Powder	Informal	Contained 0·5 per cent. salt without declaration	Packers agreed to alter labels.
S.7414 ..	Custard .. Powder	Informal	Contained 0·5 per cent. salt without declaration	Packers agreed to alter labels.
E.7538 ..	Potted Salmon	Informal	Consisted of Salmon Paste and contained only 50·5 per cent. fish (salmon)	See No. E.7584.
E.7563 ..	Salmon Paste	Informal	Consisted of Fish Paste made with white fish	Commodity now correctly labelled as fish paste.
E.7584 ..	Salmon Paste	Formal ..	Deficient 21·4 per cent. of the minimum percentage of salmon	Food Standards (General Provisions) Order. Fined £5 plus £1 15s. costs.
C.6060 ..	Cheese ..	Informal	Paraffin Wax in sample 0·72 per cent. equivalent to 0·24 per cent. on the whole cheese	No action advised.
C.6065 ..	Ice-Cream ..	Informal	Milk solids other than fat only 7·2 per cent.	Vendor interviewed. Further sample genuine.
E.7612 ..	Bread (2 slices)	Informal	Contained fragments of an insect which in size and shape resembled Blatella Germanica (steam fly)	Manufacturers cautioned.
S.7471 ..	Barley ..	Informal	Contained numerous live mites	Remainder of stock withdrawn from sale.
1/56 ..	Orange Squash, Concentrated	Informal	The sample contained particles of soot and coal-dust fragments. One minute beetle resembling Xylodromus Concinnius was also present	Manufacturers cautioned.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
C.6099 ..	Ice-Cream ..	Informal	Contained only 7·2 per cent. milk solids other than fat	Vendor interviewed and cautioned.
C.6096 ..	Ice-Cream ..	Informal	Contained only 7·25 per cent. milk solids other than fat	Vendor interviewed and cautioned.
E.7655 ..	Oatmeal ..	Informal	Infested with mites and live larvae of niptus hololeucus (golden spider beetle). Sample also contained dead niptus beetles and dead adult moths	Referred to local Sanitary Authority.
N.6048 ..	Channel Islands Milk	Formal ..	Fat content only 3·9 per cent.	Vendor cautioned and further sample advised. Ministry of Agriculture, Fisheries and Food also informed. See No. N.6176.
S.7515 ..	Cocoa ..	Informal	Contained a cocoon and one beetle resembling ptinus tectus	Remainder of stock surrendered for destruction.
S.7519 ..	Oatmeal ..	Informal	Sample clean but contained two beetles resembling niptus unicolor	Referred to local Sanitary Authority.
C.6199 ..	Pork Sausages	Informal	Meat content only 58·5 per cent	Vendor interviewed.
C.6200 ..	Flour ..	Informal	Creta Praeparata only 10·3 ounces per 280 lbs. sack and Iron only 1·0 mgms. per 100 grams	No action advised.
C.6201 ..	Flour ..	Informal	Creta Praeparata only 10·2 ounces per 280 lbs. sack and Iron only 1·2 mgms. per 100 grams	No action advised.
E.3708 ..	Spam, Canned	Informal	Sample showed very slight brown staining due to iron compounds, otherwise genuine	Packers now using different type of can.
N.6099 ..	Borax ..	Informal	Arsenic 27 parts per million, *i.e.* 23 parts per million above maximum B.P. limit yet sold with a slip label bearing the words "Pure Borax."	Vendor and packers communicated with. Sold as "Pure Borax" in error.
S.7556 ..	Channel Islands Milk ..	Formal ..	Fat content only 3·85 per cent.	Ministry of Agriculture, Fisheries and Food informed. Vendor ceased to sell this milk as Channel Islands milk.
E.7677 ..	Asthma Medicine ..	Informal	Substance recommended as a medicine without declaration of ingredients	Vendor communicated with.
S.7623 ..	Pork Sausages	Informal	Sample contaminated with blow-fly eggs	Referred to local Sanitary Authority.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
C.6279 ..	Seidlitz Powders ..	Informal	Two blue packets weighed 10·64 and 10·82 grams and one white packet weighed 2·97 grams ; the B.P. limits for Seidlitz Powders are 9·5–10·5 grams for blue packets and 2·25–2·75 grams for white packets	Vendor and manufacturers communicated with. Remainder of stock withdrawn from sale and exchanged.
N.6176 ..	Channel Islands Milk ..	Formal ..	Fat content only 3·70 per cent.	Vendor interviewed. Ministry of Agriculture, Fisheries and Food informed. Further sample genuine.
N.6163 ..	Flour, plain ..	Informal	Creta Praeparata only 10·2 ounces per 280 lbs. sack	No action advised.
E.7763 ..	Blaud's Pills ..	Informal	Consisted of Blaud's Tablets	No action advised.
E.7743 ..	Double Cream	Informal	Sample was sour when submitted, otherwise genuine	No action advised.
E.7776 ..	Compound Liquorice Powder ..	Informal	Sample was caked and mouldy. Appearance of very old stock	Remainder of stock withdrawn from sale.
C.6339 ..	Sago	Informal	Consisted of Tapioca ..	Vendor interviewed. Sold as sago in error.
C.6336 ..	Beef Sausages	Informal	Meat content only 43·5 per cent.	Vendor interviewed and cautioned.
N.6283 ..	Almonds, Ground ..	Informal	Acid Value of Oil 32. Sample also had sour taste and odour	Advised stock be withdrawn from sale.
N.6284 ..	Almonds, Ground ..	Informal	Acid Value of Oil 24. Sample also had sour taste and odour	Advised stock be withdrawn from sale.
N.6294 ..	Pork Sausages	Informal	Contained 225 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor cautioned.
E.7881 ..	Pork Sausages	Informal	Contained 65 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor cautioned.
E.7882 ..	Pork Sausages	Informal	Meat content 64·0 per cent. Contained 345 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor cautioned re preservatives.
C.6460 ..	Cake Mix with Orange Icing Sugar	Informal	Calcium Phosphate and artificial colour present in Orange Icing Sugar but not declared in list of ingredients	Correct labels now in use.
N.6320 ..	Lard	Informal	Consisted of compound cooking fat	Sold as lard in error.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.7907 ..	Almonds, Ground ..	Informal	Acid Value of Oil 11·9 and sample had stale taste	Stock withdrawn from sale.
E.7935 ..	Beef Sausages	Informal	Contained 315 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor cautioned.
E.7959 ..	Digestive Mints ..	Informal	Sample devoid of vitamins yet reference to vitamins not completely obliterated on label. Unqualified reference to high glucose content when the actual ingredient was glucose syrup solids	Packers agreed to delete reference to glucose content from labels.
E.7969 ..	Lemonade (Part Bottle) ..	Informal	Contained faint trace of sulphuretted hydrogen (0·09 part per million) probably due to action of the liquid on the vulcanised composition stopper	Manufacturers cautioned.
C.6562 ..	Rose Hip Syrup ..	Informal	Labelling of Food Order, paragraph 9, and the 2nd Schedule require declaration in terms of milligrams of Vitamin C per fluid ounce (not per 100 ml.)	Old stock. Correct labels now in use.
E.8011 ..	Salmon Paste	Informal	Fish content only 46 per cent.	See No. E.8063.
C.6595 ..	Penicillin Tablets ..	Informal	Consisted of tablets of Penicillin 100,000 units per tablet. Tablets of 200,000 units per tablet prescribed.	Tablets of 100,000 units supplied in error.
N.6391 ..	Compound Codeine Tablets ..	Informal	Tablets did not comply with B.P. disintegration test	Packers took steps to prevent a similar occurrence in future.
C.6614 ..	Bread, Part Loaf (three slices) ..	Informal	Two slices contained areas approximately $\frac{1}{4}$-in. x $\frac{5}{8}$-in. discoloured by iron oxide and carbon with a trace of oil	Bakers cautioned.
E.8063 ..	Salmon Paste	Formal ..	Deficient 43 per cent. of the minimum percentage of fish	Prosecution against retailer dismissed on Warranty. Food and Drugs Act, 1955, Section 116 (2) Manufacturer fined £5 and £7 costs.
E.8080 ..	Fish Paste ..	Informal	Deficient 52·9 per cent. of the minimum percentage of fish	Further sample not obtainable.
C.6643 ..	Potted Meat ..	Informal	Contained Meat 76·3 per cent., added water 23·7 per cent. Potted Meat should be meat and seasoning only and should not contain added water	Manufacturers agreed to describe this commodity as "Meat Paste" in future.

Table 24.—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
N.6457 ..	Parrish's .. Chemical Food B.P.	Informal	Should be labelled "Chemical Food B.P.C." Stated to be "a compound Syrup of Hypophosphates of . . ." whereas it should read "Syrup of Phosphates of . . ."	Packers communicated with and requested to amend label.
S.7958 ..	Custard .. Powder	Informal	Contained 0·5 per cent. salt without declaration	Old stock. Correct labels now in use.
E.8115 ..	Cake Mixture, Sweetened	Informal	Packet contained two dead moths and empty cocoons	Remainder of stock surrendered and destroyed.
S.8005 ..	Margarine .. (with 10 per cent. butter)	Informal	Butter content only 7·5 per cent.	Importers communicated with.
N.6498 ..	Beef Sausages	Informal	Contained 120 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor gave an assurance that the necessary notice will be displayed in future.
E.8158 ..	Cod Liver Oil	Informal	Labels refer to all kinds of lung affections including consumption. Vitamins and minerals claimed without declarations of amounts. Acid value of oil 1·6 whereas B.P. maximum is 1·2. Appearance of very old stock	Remainder of stock surrendered for destruction. Very old stock—age not known.
M.7130 ..	Salmon Steak, Canned (part can)	Informal	Consisted of fish hearts and bulbous aortae similar to those of salmon	Vendor communicated with.
N.6570 ..	Coloured .. Acetic Acid	Informal	Sample had taint resembling cough medicine or possibly turpentine. Essential oil content not more than 16 parts per million	Packers undertook to take every care to avoid a recurrence.
N.6590 ..	Channel .. Islands Milk	Formal ..	Deficient 18·7 per cent. fat and 2·9 per cent. solids-not-fat; freezing point indicated 1·6 per cent. extraneous water	Milk and Dairies (Channel Islands and South Devon Milk) Regulations, 1956. Fined £2 and £4 18s. costs.
E.8240 ..	Lentils ..	Informal	Contained live trogylphid mites	No further stock available.
E.8266 ..	Flour	Informal	Contained 820 mgms. calcium carbonate per 100 grams of flour. Maximum quantity permitted by the Flour (Composition) Regulations 390 mgms. per 100 grams of flour	Manufacturers gave an assurance that they would in future do everything possible to avoid a recurrence of an excess of calcium carbonate.
E.8268 ..	Blanc Mange .. Powder	Informal	Statement of ingredients unnecessary but when given should be complete. Sample contained 0·6 per cent. undisclosed salt	New labels now in use in which ingredients are not stated.

Table 24.—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
S.8188 ..	Barley ..	Informal	Contained 25 parts per million sulphite preservative (expressed as sulphur dioxide). The Public Health (Preservatives, etc., in Food) Regulations do not permit Barley to contain sulphur dioxide	Packers stated that barleys were so wet, when harvested, that many had to be dried twice which would be likely to result in deeper penetration by the sulphur dioxide produced by the combustion of the fuel.

The Labelling of Food Order.

The first Labelling of Food Order was made in the year 1944 but it has been amended or re-enacted on several occasions since that time. The Order at present in operation is the Labelling of Food Order, 1953, which came into operation on the 5th April of that year and which has been kept in force by the Twelfth Schedule of the Food and Drugs Act, 1955. Two amending Orders to the Labelling of Food Order, 1953, were made in the years 1953 and 1955 respectively but no amendments were made during the year 1956.

During the year under review 30 samples (19 County and 11 from Autonomous Authorities) were found to contravene the requirements of the Labelling of Food Order. Brief details of the 19 County samples will be found in table 24. Of the total number of samples to which exception was taken 15 (nine County) had labels which did not disclose one or more of the following requirements; the name and address of the packer, the true name of the food or a correct list of ingredients. In each of the above instances the packers were communicated with and their attention drawn to the requirements of the Order. During the previous year, 1955, the number of samples which contravened the Labelling of Food Order was very similar, *viz.*, 20 County samples and nine from Autonomous food and drugs authorities. In addition to samples which did not comply with the requirements of the Labelling of Food Order during the year 1956, two samples, both submitted by Autonomous food and drugs authorities, were found to contravene the requirements of The Pre-Packed Food (Weights and Measures : Marking) Order, 1950, as amended, in that the amounts of the contents in the containers did not agree with the declaration of net weight or measure on the label. In one instance the vendor was cautioned and in the other the matter was referred to the Weights and Measures Department of the authority

concerned. In the following paragraphs reference is made to a number of the more interesting samples, in relation to their labels, submitted by County Sampling Officers.

Rose Hip Syrup.—Samples Nos. C.4776, E.6193, C.5471 and C.6562.

These four informal samples, all of the same manufacture, were of satisfactory composition but they all bore a declaration on the label in respect of their Vitamin C content which was given in terms of milligrams per 100 ml. of the product instead of milligrams of Vitamin C per fluid ounce as required by Article 9 and Part I of the Second Schedule of the Labelling of Food Order, 1953. The packers were communicated with and it transpired that all the above samples were of relatively old stock and that the firm was actually using correctly worded labels at the time of writing.

Health Food.—Sample No. E.6250.

This informal pre-packed sample bore a label giving a list of ingredients and also making a claim that it contained certain minimum quantities of four vitamins and two minerals. Assays of two of the vitamins, *viz.*, Vitamin B_1 and B_2, were carried out and these were found to be present in the correct amounts. In respect of the two minerals, however, iron was present to the extent of 3·5 milligrams per ounce against a declaration of 9 milligrams per ounce, while calcium was only present to the extent of 80 milligrams per ounce as against a declaration of 540 milligrams per ounce. These were serious deficiencies and the packers were communicated with ; they withdrew the remainder of the stock from sale and carried out an investigation to ascertain the cause of the discrepancies. They ultimately informed the County Medical Officer of Health that the remainder of the stock, which they had analysed, showed wide variations in its iron and calcium contents and they also had other reasons for thinking that a mixing machine at the factory had not been operating correctly at the time this particular batch was made. Molasses formed one of the major ingredients of this commodity and the packer also stated that they had found very variable iron and calcium contents in their supplies of this ingredient. They undertook to make arrangements which should prevent any discrepancy of the type referred to above occurring in future.

Creamed Mushrooms, Canned.—Sample No. E.6687.

This informal sample bore on the label a list of ingredients which read as follows : " Fresh Mushrooms, Milk, Flour, Edible Fat, Butter, Salt and Pepper." Upon analysis, however, it was found that the sample

had a total fat content of 4·6 per cent. Butter fat as a percentage of the total fat was only 2·5 per cent., which corresponds to a butter fat content calculated on the sample of only ·01 per cent. The salt content of the sample was 1·0 per cent., the flour content was 5 per cent., and the amount of milk solids-not-fat present corresponded to the presence of approximately 40 per cent. of skimmed milk. The Labelling of Food Order requires that the ingredients of a food must be specified in the order of the proportions in which they were used, the ingredient used in the greatest proportion being specified first. It follows that the word " butter " in the above list of ingredients is not in its correct place ; furthermore, the word " milk " is incorrect and should be replaced by the name " skimmed milk." The packers were communicated with and they stated that while the list of ingredients had originally been correct the method of manufacture had been altered without at the same time altering the label. The list of ingredients on the label now in use reads " Fresh Mushrooms, Skimmed Milk, Flour, Edible Fat, Salt, Butter and Pepper."

Pickled Herrings in Fresh Lemon Juice, Bottled.—Sample No. E.6994.

This informal sample bore a list of ingredients which read " Herrings, Onions, Acetic Acid, Spirit Vinegar, Salt, Saccharin, Fresh Lemon Juice." Upon analysis, however, this sample, was found to contain 5 per cent. of lemon juice, 3·1 per cent. of salt and 0·03 per cent. of saccharin but it was entirely devoid of Vitamin C. The packers were communicated with and it was pointed out that the ingredients lemon juice, salt and saccharin, were declared in the wrong order in the list of ingredients ; furthermore, it was also pointed out that, particularly in the entire absence of Vitamin C, it was not considered that the use of the word " fresh " in relation to the lemon juice was justified. The packers at once agreed to delete the word " fresh " and place saccharin at the end of the list of ingredients when new labels were printed. With regard, however, to the salt and lemon juice they stated that the salt content varied considerably because of the type of fish used and weather conditions and that the relative proportion of these two ingredients might, therefore, quite frequently be altered. This point was the subject of further correspondence and it was pointed out that the name of the product, *viz.*, " Pickled Herrings in Lemon Juice " could only be justified if there was a reasonable amount of lemon juice present. For that reason alone there should, in general, be more lemon juice than salt present and the name " lemon juice " should precede the word " salt " in the list of ingredients.

Vitaminised Sweets.—Sample No. E.7326.

This informal pre-packed sample bore a label which declared that, at the time of manufacture, 10 of the dragees contained specified amounts of six named vitamins. The amounts of Vitamins A, B_1 and C present were determined. These were found to correspond to the quantities claimed on the label but this form of declaration is not that prescribed by Article 9 and Part I of the Second Schedule of the Labelling of Food Order which require the vitamin contents to be calculated to the amounts present per ounce and not per 10 dragees. The packers were communicated with and at first they emphasised that the product was intended to be pharmaceutical and not sweet confectionery and, that being so, they considered that they had labelled the product according to the requirements of the Pharmacy and Medicines Act. In further correspondence it was, however, pointed out to the packers that the word " dragee " usually means a sweetmeat and that it is not used in the B.P., B.P.C., or the National Formulary as descriptive of any form of drug. Furthermore, the definition of " Food " in the Labelling of Food Order specifically does not exclude an article by reason only that it is also capable of being used as a medicine. There was no indication on the label of this particular product that it was to be regarded specifically as a medicine and it was felt that the requirements of the Labelling of Food Order should apply just as they apply to the many other vitaminised foods of various kinds on the market. In view of the fact that the declaration on the label gave the information required, but not in the form required, the point raised was considered to be purely technical but there was no doubt in the opinion of your Analyst that the product ought to comply strictly with the requirements of the Labelling of Food Order. As the result of the further correspondence the packers agreed to re-label this commodity and to conform to the requirements of the Labelling of Food Order.

Digestive Mints.—Sample No. E.7959.

These pre-packed mints bore a label which stated " High Glucose Content " and also bore the words " Vitamins A, B, C and D." The last statement had been partially scored out but was still perfectly legible, in fact, it was difficult at first to see that any attempt at all had been made to erase this statement. The sample consisted of wrapped glacé mints and upon analysis they were found to be completely devoid of any vitamins and it was also found that they contained 36 per cent. of solids derived from liquid glucose (or glucose syrup) which consists of a mixture of dextrose, maltose and dextrin. The ingredient used was not, therefore, the single substance glucose (dextrose) and the amount of this particular sugar derived from the glucose syrup used was not more than 9 per cent.

It was felt that the use of the unqualified word " glucose " on the label was not correct in view of the actual ingredient used and that the amount of dextrose actually present, *viz.*, not more than 9 per cent., did not justify the claim " high glucose content " particularly in view of the fact that liquid glucose in a similar amount is invariably used in the manufacture of this particular type of sweet and that other manufacturers, in the experience of your Analyst, do not make any claim in respect of its presence. The packers were communicated with and they at once admitted that the words with respect to the presence of vitamins should have been completely deleted from the label but it was only after rather prolonged correspondence that they agreed to take steps to delete all reference to glucose content from their labels.

Ice-Cream.

The first Standards Order for ice-cream was made in March, 1951, but due to shortages of fats and milk powder it was soon found impossible to maintain the standards then formulated without reducing supplies of ice-cream. The Minister of Food, therefore, introduced, as a temporary measure, reduced standards for fat and milk solids other than fat in July, 1952. During the year 1953, however, the supply position improved again and the Food Standards (Ice-Cream) Order, 1953, which came into operation on the 1st June, 1953, restored the original standards fixed in the year 1951 and these standards are still in operation to-day. It should be remembered that even these standards are not ideal and when they were originally recommended by the Food Standards Committee of the Ministry of Food the Committee considered that the standards should be amended and progressively improved as supplies of ingredients became more plentiful. Furthermore, the Committee considered that the description " ice-cream " should eventually be restricted to a dairy product containing a high proportion of milk solids.

The present standard for ice-cream contained in the Schedule to the 1953 Order is as follows :—

" 1. Ice-cream shall contain not less than five per cent. fat, 10 per cent. sugar and $7\frac{1}{2}$ per cent. milk solids other than fat :

Provided that—

(i.) ice-cream containing any fruit, fruit pulp or fruit puree shall either conform to the standard set forth above or, alternatively, the total content of fat, sugar and milk solids other than fat shall be not less than 25 per cent. of the ice-cream including the fruit, fruit pulp or fruit puree, as the case may be, and such total content of fat, sugar and milk solids other than fat shall include not less than $7\frac{1}{2}$ per cent. fat, 10 per cent. sugar and two per cent. milk solids other than fat :

(ii.) ' Parev ' (kosher) ice sold, offered or exposed for sale under that description shall contain not less than 10 per cent. fat and not less than 14 per cent. sugar, and the standard for ice-cream set forth above shall not apply to this product.

" 2. For the purpose of the standards prescribed above ' sugar ' means sucrose, invert sugar or the solids of any sweetening material derived from starch so however that no ice-cream shall contain less than $7\frac{1}{2}$ per cent. sucrose.

" 3. Each reference in this Schedule to any proportion or percentage means that proportion or percentage by weight."

It will be noted that the average fat content of ice-cream during the year under review has increased when compared with the previous year and that the improvement in the fat content of ice-cream found over the last eight years, is still being maintained. A perusal of table 25 shows that the average fat content in 1946 was only 2·3 per cent. whereas in 1954 and again in 1956 it was 9·2 per cent. Furthermore, the lowest fat content during 1955 was 3·5 per cent. and in 1956, 3·6 per cent. ; whereas in the four years 1946 to 1949 fats as low as 0·3 and even 0·1 per cent. were found.

The average fat content of ice-cream has increased in a striking manner since 1946, but the increases noted since 1948 were, in the first place, due to the action of the Ministry of Food in allocating from November, 1948, additional supplies of sugar and in certain cases fats to those ice-cream manufacturers who, at that time, undertook to include at least 2·5 per cent. fat in their ice-cream. This step to increase the quality of ice-cream was taken more than two years before the first statutory standard for ice-cream was made.

During the year 1956, 94 samples of ice-cream were submitted for chemical analysis, 51 by County Sampling Officers and 43 by Autonomous Food and Drugs Authorities. Although no harmful ingredients were found in any of the samples, seven (five County and two from an Autonomous Authority) did not comply with the Food Standards (Ice-Cream) Order. In the year 1955 15 samples were reported upon adversely. Of the five unsatisfactory County samples, two were deficient in fat and three deficient in milk solids other than fat. The two unsatisfactory samples from an Autonomous Authority were both deficient in fat. Details of the incorrect County samples, together with the action taken, will be found in table 24. In view of the serious deficiency in fat, legal proceedings were recommended in respect of one of the samples submitted by an Autonomous Authority.

The average figures found for the 94 samples were—total solids 34·0 per cent. (maximum 43·6 ; minimum 26·3) and for fat content 9·2 per cent. (maximum 16·4 ; minimum 3·6). These figures, as will be seen from the following table, which includes figures for the last 11 years, show that the big improvement noted in the year 1950 has been maintained. It will be remembered that prior to the war a figure of eight per cent. was suggested by a trade association as a minimum standard for fat content and it is interesting to note that during the year under review, 56 samples out of the total of 94 showed fat contents varying from 8·1 to 16·4 per cent.

Table 25.

Ice-Cream.

Year.	Number of Samples	Fat Content Average %	Total Solids Average %	Highest Fat %	Lowest Fat %	Highest Total Solids %	Lowest Total Solids %
1946 ...	45	2·3	22·5	10·7	0·1	36·8	13·3
1947 ...	59	3·0	23·6	10·6	Less than 0·1	39·2	14·1
1948 ...	53	3·9	25·3	11·3	0·1	33·4	18·9
1949 ...	171	6·4	29·3	13·3	0·3	45·9	14·7
1950 ...	186	8·5	32·1	14·7	2·2	43·0	20·1
1951 ...	230	8·6	32·6	15·6	3·3	40·7	23·0
1952 ...	143	9·0	32·8	13·7	2·0	40·0	19·6
1953 ...	130	8·6	32·7	15·2	2·5	42·3	23·3
1954 ...	90	9·2	34·6	13·8	3·1	44·0	24·8
1955 ...	95	8·1	33·2	13·3	3·5	40·9	24·3
1956 ...	94	9·2	34·0	16·4	3·6	43·6	26·3

Ice Lollies.

During the year under review 23 samples of ice lollies were submitted for examination under the Food and Drugs Act. Eleven of the samples were submitted by County Sampling Officers, the remaining 12 samples being from Autonomous Food and Drugs Authorities. Unlike ice-cream there is no statutory standard for the composition of ice lollies. They are specifically excluded from the provisions of the Food Standards (Ice-Cream) Order while the Food Standards (Soft Drinks) Order refers only

to liquid soft drinks although ice lollies are, in general, similar in composition to soft drinks. Ice lollies and ice-cream are, however, both specifically mentioned in the revised reports on lead and arsenic of the Food Standards Committee of the Ministry of Food which were published in the years 1954 and 1955 respectively. In these reports maximum limits of only one part per million for lead and 0·5 part per million for arsenic (as As) are recommended for both types of commodities. The limits for the majority of other foods being two parts per million and one part per million respectively. In addition to the special recommended limits for lead and arsenic referred to above there are also general recommended maximum limits for two other toxic metals in foods, *viz.*, copper 20 parts per million and zinc 50 parts per million. All the samples of Ice Lollies submitted during the year 1956 were found upon examination to comply with the foregoing recommendations.

The total solids (sugars, etc.) in the samples ranged from as little as 3·3 per cent. to 20·5 per cent. with an average for the 23 samples of 9·1 per cent. The average total solids on 24 samples examined in the previous year was 9·5 per cent. while the range of total solids obtained in the years 1952, 1953 and 1954 were very similar to the figures given above for the year under review.

Sausage, Meat Paste and Fish Paste.

On the 1st March, 1953, the last of the Meat Products Orders was revoked and this had the effect of removing all restrictions, for control purposes, on the price and composition of both pork and beef sausages. It should be noted, however, that the Orders mentioned above were made by the Minister of Food for the purpose of controlling the sale of certain commodities which were, or had been, in short supply. Foods and drugs must, in addition, satisfy the requirements of the Food and Drugs Act. Under section 2 of the 1955 Act a food or drug sold to a purchaser must be of the nature, substance or quality of the article demanded ; if no Statutory Standard exists under the Act for the particular article in question a prosecution may still be instituted in respect of a sample regarded as unsatisfactory and the Court itself must then fix a standard based on the evidence before it. Even in the days of Ministry of Food control it was always necessary, in prosecutions by Food and Drugs Authorities in connection with samples of sausage alleged to be deficient in meat, for the Court to fix its own standard (because the standard made by the Minister of Food was not made under the Food and Drugs Acts) although in so doing the Court would have regard to the standard then in operation for commodity control purposes. In view of the increased supplies of meat available it would appear reasonable to expect that sausages should now have at least the same meat content as in the days of control and short supply and successful prosecutions were instituted by the County, in the years 1953, 1954 and 1955, subsequent to the

revocation of the Meat Products Orders, in respect of samples of pork sausages found to be seriously deficient in meat. In these cases the Courts accepted the opinion of your Analyst that genuine pork sausage must contain not less than 65 per cent. of meat.

During the year under review, however, the position has been made difficult by the results of two Appeal cases in which the judgments went against the prosecution. In the case of Marston *v.* Loney heard in October, 1955, the standard suggested by the Analyst was based on the standard previously fixed under the Meat Products Order which by then had been revoked. No other evidence as to a standard was given. In the other case of Thrussell *v.* Whiteman in January, 1956, the Lord Chief Justice said " The sooner it is seen that these cases lead to chaos and it is prescribed what a sausage is the better," he also thought that it depended on the price. This last is quite a new concept in deciding whether a particular food is genuine and up to standard so far, at least, as the Food and Drugs Act is concerned. While successful prosecutions have been taken by some Food and Drugs Authorities subsequent to the above Appeal cases there is no doubt that it is now more difficult to obtain convictions particularly in the case of sausages which are relatively cheap in price.

In view of the position described in the previous paragraph it is gratifying to find that the Food Standards Committee of the Ministry of Agriculture, Fisheries and Food has heard evidence from all branches of the sausage trade and from organisations concerned with the enforcement of food and drugs legislation and has recommended, in a report published in June, 1956, that statutory standards should be fixed for sausages. The recommendations include : (*a*) a minimum standard of 65 per cent. meat for sausages made wholly or mainly with pork and 50 per cent. meat for all other meat sausages ; (*b*) the proportion of fat not to exceed 50 per cent. of the total meat content ; (*c*) the standards to apply to uncooked sausages, sausage meat, skinless sausages, chipolatas and slicing sausages ; (*d*) the sale of sub-standard sausages to be prohibited. The majority of the Food Standards Committee considered that the description " Pork Sausage " and " Beef Sausage " should apply where at least four-fifths of the meat content consisted of the named meat but some members of the Committee considered that these names should only apply when the whole of the meat content consists of the named meat. The Committee also recommended that at least one-and-a-half pounds of sausage should be purchased when it was intended to obtain a divided sample for analysis. The report also contains tables which show the variation in price and meat content of pork and beef sausages over the last three years and the distribution of some 11,000 samples grouped in regard to price and meat content.

The last Meat Products Order, revoked on the 1st March, 1953, in addition to controlling price and meat content, also prohibited the use of certain specified offals in the preparation of sausages and other uncooked open meat products intended for human consumption. The restriction on the use of these offals was re-enacted in the Offals in Meat Products Order, 1953, which came into operation on the 1st March, 1953, and this Order provided that proceedings for an infringement might be brought by a Food and Drugs Authority without the consent of the Minister of Food. The Food Standards Committee in their report on sausages recommend that this Order be retained.

The compositions of meat paste and of fish paste are controlled by the Food Standards (Meat Paste) Order, 1951, and the Food Standards (Fish Paste) Order, 1951. The standard for meat paste is a minimum of 55 per cent. meat and for fish paste a minimum of 70 per cent. fish. The standards apply to both imported and home produced products.

During the year 1956, 102 samples of sausage, two of sausage meat, and one of canned sausage were examined as against 119 samples of sausage, three of sausage meat, two of Cumberland sausage and three of canned sausage in the previous year. Sixty-one samples were examined for the County (including one sausage meat and one canned sausages) and 44 (including one pork sausage meat) for Autonomous Food and Drugs Authorities. Of the total number of sausage samples submitted during the year under review, 40 (including one sausage meat) consisted of beef and 64 of pork (including one sausage meat). Twenty County samples and 12 submitted by other Food and Drugs Authorities were reported upon adversely. A perusal of table 24 will show that 12 of the County samples were deficient in meat but that many of these were only slightly deficient. Fourteen of the samples examined, including 10 County samples, contained normal amounts of sulphite preservative but without any declaration of the presence of preservative being exhibited In the shops concerned. This is contrary to the requirements of the Public Health (Preservatives, etc., in Food) Regulations, 1925–1953. In addition, one County sample was contaminated with blow-fly eggs. Details of all the adulterated County samples, together with the action taken, will be found in table 24. It will be noted that no legal proceedings were instituted in respect of sausage samples during the year 1956.

It is interesting to note that the average meat content of 39 samples of beef sausage examined in the County Laboratory during the year 1956 was 60·0 per cent., while the average meat content of 63 samples of pork sausage examined over the same period was 67·3 per cent. Bearing in mind that the standards before the 1st March, 1953, under the Commodity

Control Order, were a minimum of 50 per cent. meat for beef sausage and beef sausage meat and a minimum of 65 per cent. meat for pork sausage and pork sausage meat, the average figure obtained in the County Laboratory during the year 1956 for beef sausages is very satisfactory. In fact of 39 samples of beef sausage only two contained less than 50 per cent. meat. With regard to pork sausage the average results are also satisfactory and there is a slight improvement on the results obtained in the previous year. It will be remembered that the average meat content for 63 samples submitted during the year 1955 was 65·7 per cent. Of the 63 samples of pork sausages submitted during the year 1956, 20 (or 32 per cent.) contained less than 65 per cent. meat. Although this cannot be regarded as satisfactory it must be emphasised that it cannot be assumed that the position with regard to pork sausage has deteriorated since control was removed at the beginning of the year 1953. Fifty per cent. of the pork sausage samples submitted in each of the years 1951, 1952 and 1953 were reported upon adversely and the proportions of unsatisfactory samples for the years 1954 and 1955 was 39 per cent. and 24 per cent. respectively.

Twenty-four samples of meat paste (20 submitted by County Sampling Officers and four by Autonomous Authorities) were examined during the year. Of these, one sample submitted by a County Sampling Officer (No. C.5059, Ox Tongue Spread) was found to have a meat content of only 50·5 per cent. The packers were communicated with and undertook to take steps to prevent a similar occurrence in future.

With regard to fish paste, 17 samples (12 County) were submitted for examination during the year and, of these, eight (seven County and one from an Autonomous Authority) were reported upon adversely. Three formal County samples, all submitted as Salmon Paste, Nos. E.7523 (consisted of Fish Paste prepared from white fish), E.7584 (deficient of 21·4 per cent. of the minimum percentage of fish) and E.8063 (deficient of 43 per cent. of the minimum percentage of fish), were the subjects of successful legal proceedings. In the first case the vendor was fined £5 and £5 19s. costs and in the second case the vendor was fined £5 and 35s. costs. The summons against the vendor in the remaining case was dismissed on Warranty and legal proceedings were subsequently instituted against the manufacturer under Section 116 of the Food and Drugs Act and he was fined £5 and £7 costs. The one sample reported upon adversely from an Autonomous Food and Drugs Authority was found to have a fish content of only 46 per cent. and the manufacturers were interviewed. Details of all the adulterated County samples, together with the action taken, will be found in table 24.

Fresh Fruit.

In the report for the year 1954, attention was directed in some detail to the necessity which now exists for examining fresh fruit for added chemicals. This arises mainly from the extensive use of insecticidal sprays by growers and of anti-mould agents by packers for the purpose of ensuring better crops and the marketing of sound produce. It is one of the duties of the Public Analyst to see that no harmful quantity of any chemical residue remains on fruit or other food when it is offered for sale and that existing regulations are complied with, in particular, the Public Health (Preservatives, etc., in Food) Regulations and the Mineral Oil in Food Order. With this in view the staff of the County Laboratory during the year under review has continued to examine samples of apples, etc., for excessive amounts of lead and arsenic which might arise from the use of lead arsenate sprays and samples of citrus fruits for thiourea, diphenyl, boron preservative and mineral oil.

During the year 1956, 41 samples of fresh fruit were examined in the County Laboratory, of these 34 were submitted by the County Sampling Officers and seven by Autonomous Food and Drugs Authorities. In addition, one sample of Fresh Tomatoes was also examined. The samples consisted of the following varieties of fruit: 12 Apples, four Pears, 19 Oranges, two Lemons, two Grapefruit, one Tangerines and one Grapes. With the exception of two samples of apples all the samples were reported to be satisfactory. The sample of grapes contained on the skins a trace of sulphur amounting to 38 parts per million parts of the fruit, this had probably been sprayed or dusted on by the grower as an anti-mould agent; no adverse comment was made in respect of the presence of this small amount of sulphur. The two unsatisfactory samples of apples, Nos. N.4957 and N.4993, were both from the same source and upon examination they were found to contain on their skins amounts of lead and arsenic which, when calculated to the whole fruit, exceeded the normal permitted limits of 2 parts per million of lead and 1 part per million for arsenic (as As). Sample No. N.4957 contained 4·5 parts per million of lead and 1·2 parts per million of arsenic while sample No. N.4993 contained 5·6 parts per million of lead and 1·4 parts per million of arsenic. The apples were foreign produce and the importers, the Port Health Authority concerned and the Ministry of Agriculture, Fisheries and Food were all notified of the results of the examination. As a result, further samples of apples from the same country were taken at the port of arrival and the foreign shippers agreed to have future consignments checked and cleansed if necessary. The Ministry of Agriculture, Fisheries and Food also stated that they were making an approach to the Authorities in the country of origin about this matter. The sample of fresh tomatoes, in

addition to being examined for arsenic, metals, thiourea and diphenyl, was also examined for the presence of parathion but this and the other chemicals mentioned were all absent.

Soft Drinks and Fruit Juices.

In December of the year 1953 most of the controls previously exercised by the Minister of Food in respect of soft drinks were revoked. The Standards for soft drinks, however, in regard to their fruit juice, sugar, saccharin, etc., contents, which were previously incorporated in the Soft Drinks Order, 1947, were continued with minor alterations in the Food Standards (Soft Drinks) Order, which came into operation on the same date that the other controls ceased. There were no amendments to the Standards Order during the year 1956.

The Food Standards (Soft Drinks) Order, 1953, incorporates the following provisions which were previously covered by licences issued by the Ministry of Food : medicated drinks conspicuously and properly labelled as such and glucose beverages which contain not less than 23 per cent. weight in volume of liquid glucose, or alternatively not less than 10 per cent. weight in volume of dextrose monohydrate, are exempt from the standards prescribed in the Order. Soft drinks clearly labelled that they are intended for consumption by diabetics are also exempt from the standards in so far as sugar and saccharin content are concerned. Ginger beer and other herbal beers are included in the standards but allowance may be made for any loss in sugar content due to brewing. Specific references to non-alcoholic wine, non-alcoholic cider and non-alcoholic perry do not appear in the Standards Order but these presumably are covered by the general heading " Any other description of soft drink containing fruit juice." Drinks made from whole fresh oranges are described as such in the Standards Order and not as " squash made from whole fresh oranges " which was the previous description.

A further exemption from the provisions of the Standards Order was introduced by the Food Standards (Soft Drinks) (Amendment) Order, 1954, which came into operation on the 22nd August, 1954. Prior to that date fruit juice was only exempted from the requirements of the Standards Order when in a pure undiluted condition ; this exemption has now been extended to include all undiluted fruit juice, with or without added sugar, and any such juice in a concentrated (or frozen) form.

During the year 1956, 26 samples of soft drinks have been examined, including 12 samples submitted from Autonomous Food and Drugs Authorities. The total number of samples under this heading submitted during the previous year was 63. Included in the total for the year under

review were four samples of various types of mineral waters, nine samples of soft drinks for consumption after dilution (squash, etc.), 11 samples of orange and other fruit drinks in one-third pint bottles, one glucose drink and one non-alcoholic beverage. In addition, two tomato juice cocktails and three soft drink powders were examined but these do not come within the Statutory definition of " soft drink."

Of the above samples nine (four County and five submitted by Autonomous Authorities) were reported upon adversely. An informal County sample of Pineapple drink, No. N.4913, was submitted in two one-third pint bottles, the aluminium caps of which were embossedwith the word " Pineapple " and a name and address ; the bottles themselves bore an enamelled label which stated " Pure Fruit Juice " and " Pure Cane Sugar " together with other wording. Upon analysis the sample was found to contain approximately 7·5 per cent. of pineapple juice ; it was also sweetened with sugar, artificially coloured and contained added citric acid. The packers were communicated with and informed that the name pineapple was not considered a sufficient indication of the true nature of this commodity and they agreed to reprint the bottle caps with the words " Pineapple Drink—ready for use." It was also pointed out that the other wording on the bottles themselves, *i.e.*, " Pure Fruit Juice " and " Pure Cane Sugar " could be misleading in that it might be interpreted by a customer as meaning that the commodity was simply sweetened pineapple juice and nothing else ; whereas analysis had shown that it contained only a small proportion of pineapple juice and it also had other ingredients, *i.e.*, colouring matter and added citric acid. The Labelling of Food Order exempts soft drinks from the requirement to declare a list of ingredients but your Analyst holds the view that if a claim is made, as in this instance, with regard to certain ingredients then mention should be made of all the ingredients in their correct order, otherwise a false impression may be created as to the composition of the article. It was suggested to the packers in this instance that they had three alternatives (*a*) to make no claim at all with regard to ingredients, (*b*) to give a complete list of ingredients, or (*c*) to state that the " ingredients include—pure fruit juice and pure can sugar." The fact that the bottles themselves bore an enamelled label made it impossible to alter the present wording without destroying all the bottles and it was ultimately agreed after prolonged correspondence that the wording on the aluminium caps would be amended at once and that the wording on the bottles would be altered as soon as a new stock of bottles was required.

An informal sample of Quinine Tonic Water, No. C.5691, was found upon analysis to contain only 0·39 grains of quinine sulphate per pint instead of 0·5 grains per pint as required by the Food Standards (Soft Drinks) Order. The packers were communicated with and they stated

that they had been advised that the quinine would decompose if kept in sunlight and that the deficiency found might be due to this cause ; they had carried out a check of their manufacturing process and the correct amount of quinine had originally been added. It is, of course, true that quinine should be stored protected from light and that it is decomposed by ultra-violet light but under ordinary daylight conditions it would probably take a week or more for the quinine content to drop to the extent noted. It was suggested that it might be advisable for labels to state that the commodity should not be kept or displayed in strong sunlight. A bottle of Orange Squash, Sample No. 1/56, was submitted on complaint that it contained foreign matter. Upon examination it was found to contain some particles of soot and coal-dust and one minute beetle. The packers of this commodity were cautioned. The remaining unsatisfactory County sample was a part bottle of Lemonade, No. E.7969, which was submitted on complaint of taint and to which reference is made in the section of this report dealing with samples containing extraneous matter. The five unsatisfactory samples received from Autonomous Food and Drugs Authorities included a sample of Orange Squash for which an unjustifiable claim with regard to Vitamin C was made ; a Grapefruit Crush which contained a very slight excess of sulphite preservative ; a bottle of Lemonade which contained two buttons made from casein-formaldehyde plastic which had liberated a minute trace (0·5 part per million) of formaldehyde to the lemonade ; a soft drink powder which contained one very small fragment of glass weighing less than one milligram and another soft drink powder which had a list of ingredients given in the wrong order in that it stated " Glucose Monohydrate, Sugar, . . ." whereas upon analysis it was found to contain 64 per cent. sucrose and only 33 per cent. of glucose monohydrate.

Although fruit juices do not come within the provisions of the Food Standards (Soft Drinks) Order it is convenient to mention them here. During the year 1956, 15 samples (10 County) of fruit juice, either bottled or canned, were examined in the County Laboratory ; in addition, three samples of tomato juice were also examined. All the above samples were reported to be genuine and there was, therefore, no instance during the year under review of a diluted soft drink being offered for sale as a pure fruit juice. It will be remembered that in these reports for the years 1954 and 1955 reference was made to four successful prosecutions instituted because samples submitted as orange juice proved, upon analysis, to be only soft drinks containing a relatively small proportion of orange or orange juice which varied, in these particular instances, from 4·6 to 14·0 per cent. The 15 samples of fruit juice examined during the year under review included nine of organce juice, four lemon juice, one pineapple juice and one blackcurrant juice.

Margarine.

Margarine was derationed on the 8th May, 1954, and following that two important changes were made in its composition. The first is that two months after rationing ceased margarine was no longer permitted to contain boron preservative. This resulted from the amendment introduced in clause 2 (e) of the Public Health (Preservatives, etc., in Food) (Amendment) Regulations, 1953. The second change in composition was due to the making of the Food Standards (Margarine) Order, 1954, which came into operation on the 16th May, 1954. The Order applies only in respect of sales by retail and to both imported and home-produced margarine. A sale by retail includes a sale of margarine as such by a caterer but does not include a sale to a caterer for the purpose of his catering business or a sale to a manufacturer for the purpose of his manufacturing business. The standard prescribed by the Order is given in the First Schedule and refers to Vitamin A and Vitamin D content of margarine and is as follows :—

" Each ounce of margarine shall contain—

(*a*) not less than 760 international units and not more than 940 international units of vitamin A determined in accordance with the method set forth in the Second Schedule to this Order. The vitamin A content shall be calculated as the sum of the vitamin A present as such or as its esters plus 0·8 times the beta-carotene equivalent of any carotenes present ; any alpha-carotene being considered as equivalent in potency to half its weight of beta-carotene ; and when red palm oil is used as a source of carotenes, the beta-carotene equivalent shall be taken as 53·5 per cent. of the total carotenes ;

(*b*) not less than 80 international units and not more than 100 international units of vitamin D."

The amount of vitamin D now required to be present is approximately the same as that previously required to be present (90 i.u. per ounce) under the terms of manufacturing licenses in the days of control but the amount of vitamin A now prescribed is higher than in the days of control when it was limited to 450 to 550 i.u., per ounce. The present standard has resulted in the vitamin A content of margarine being raised to the average vitamin A content of butter.

The Standards Order not only prescribes the standard but it also, in the Second Schedule, prescribes the method by which the vitamin A content is to be determined and calculated. In view of the fact that the determination of vitamin D can, as yet, only be satisfactorily carried out by a very time-consuming and expensive biological assay no method

for its determination has been included in the Order. Agreement was reached, however, between the Ministry of Food and manufacturers in this country that the vitamins would be added to margarine through the medium of a master mix in which the proportions of vitamins A and D are in the ratio of 940 : 100. A satisfactory vitamin A determination will, therefore, also be indicative of the presence of the correct amount of vitamin D.

It should also be mentioned that in common with the procedure for other Food Standards Orders legal proceedings may now be instituted by Food and Drugs Authorities in respect of samples of margarine deficient in vitamins without the consent of the Minister of Food. Prior to the making of the Food Standards (Margarine) Order control of the vitamin content of margarine was exercised solely by the Ministry of Food in that inclusion of specified amounts of vitamins A and D was a condition of the issue of a manufacturing licence.

During the year 1955 legislation with regard to margarine was further amended in that the Food Standards (Butter and Magarine) Regulations, 1955, and the Labelling of Food (Amendment) Regulations, 1955, now govern the Standards for moisture and butter content and the labelling requirements for margarine. The Standards prescribed are similar to those which were previously prescribed under Section 32 of the Food and Drugs Act, 1938, but the labelling requirements of Section 33 of that Act have been modified and in some respects made less restrictive than formerly. The maximum limit for water content of margarine is, of course, the same as the limit for water in butter, *viz.*, 16 per cent., but, in addition, both the 1938 Act and the new Regulations prohibit the presence of more than 10 per cent. of fat derived from milk in the fat content of margarine. Furthermore, any claim that margarine contains butter must be accompanied by a statement of the percentage of butter present but no offence is deemed to have been committed if the figure stated does not differ by more than two from the actual percentage of butter present. The provision that not more than 10 per cent. of milk-fat shall be present in margarine is made under the new Standards Regulations while the tolerance of two per cent. in respect of claims of the presence of butter is made under the new Labelling Regulations ; it follows, therefore, that if 10 per cent. butter is claimed, the tolerance of two per cent. in this instance, strictly speaking, cannot operate to allow 12 per cent. to be actually present. The sale of margarine containing butter was reintroduced after rationing ceased in May, 1954, and this type of margarine is now quite commonly sold. It is interesting to note that, in your Analyst's experience, where a claim of the presence of butter is made it is invariably a claim for the maximum butter content permitted, *i.e.*, 10 per cent.

During the year under review, a total of 97 samples of margarine were submitted for examination, 69 by County Sampling Officers and 28 by Autonomous Food and Drugs Authorities. Of these, 46 samples (27 County and 19 from Autonomous Food and Drugs Authorities) were examined for their Vitamin A content by the prescribed method. In respect of 44 of the samples (29 County and 15 from Autonomous Food and Drugs Authorities) claims were made of the presence of 10 per cent. of butter and the butter content of each of these samples was determined. Four samples in all were reported upon adversely, including two County samples. Informal County sample No. C.5310, taken at a Day Nursery, did not bear the word "Margarine" on the label as required by the Labelling of Food (Amendment) Regulations, 1955. The packers were commicated with and agreed to alter the labels. The remaining County sample, No. S.8005, also submitted informally, was of imported margarine and was declared to contain 10 per cent. butter. Upon examination, however, it was found to contain only 7·5 per cent. butter. This sample was of the same brand of margarine as the sample mentioned below, submitted by an Autonomous Food and Drugs Authority, which was found to contain only 6·5 per cent. butter. The importers of Sample No. S.8005 were communicated with and eventually, a representative of the foreign manufacturers and a representative of the firm of importers were interviewed. The importers were deeply concerned that these deficiencies had been brought to their notice as they realised that they could be held responsible, under the Food and Drugs Act, for the composition of an imported commodity. The remaining two unsatisfactory samples were both submitted by the same Autonomous Food and Drugs Authority. One of the samples was found to contain boron preservative and the remainder of the stock was withdrawn from sale, the Ministry of Agriculture, Fisheries and Food was also informed. The other unsatisfactory sample, declared to contain 10 per cent. butter, was found to contain only 6·5 per cent. butter. Formal follow-up samples of the same brand, however, were found to be satisfactory and the packers were communicated with in regard to the deficiency in butter content found in the original sample.

The Flour (Composition) Regulations, 1956.

It will be remembered that the Flour Order, 1953, ended the control of flour mills but it stipulated that, with the exception of (1) flour containing the whole of the products derived from the milling of wheat and no additions whatsoever or (2) flour which is the subject of a licence granted by the Minister of Food, all other flours must contain certain compulsory additions. It was obligatory to add to all flour (with the two exceptions noted above) Creta Praeparata, of British Pharmacopoeia or British Pharmaceutical Codex quality and of a prescribed fineness, to the

extent of 14 ounces per 280 lbs. flour, *i.e.*, at the same rate at which this substance was incorporated in National flour. In addition to the above, other substances were to be restored to flours of an extraction rate less than 80 per cent., *i.e.*, to white flours of an extraction rate less than that of National flour. These new ingredients were Iron, Vitamin B_1 and Nicotinic acid and they had to be added in sufficient quantity to ensure total minimum contents of 1·65, 0·24 and 1·60 milligrams respectively per 100 grams of the flour. The last three substances were restored to lower extraction rate flour as the result of the unanimous recommendation of the Conference on the Post-war Loaf whose Report was published in the year 1945. The three important nutrients mentioned are present naturally to the recommended amounts in flour of 80 per cent. extraction but when the extraction rate is reduced below 80 per cent., to give a whiter flour, the content of these nutrients is also reduced ; they must, therefore be restored artificially if the nutritional value of the flour is to be unimpaired. The Flour Order was enforced centrally by the Ministry of Food but Food and Drugs Authorities were requested to refer to the Ministry details of any samples which did not conform with the requirements indicated above. An amendment to the Labelling of Food Order which came into operation on the 1st January, 1954, permits flour to be sold without a declaration on the label of the compulsory additions which, under the Flour Order, are required to be present.

The Flour Order, 1953, was revoked on the 30th September, 1956, when the bread subsidy was abolished. On the same day, however, the Flour (Composition) Regulations came into operation and these have the effect of re-enacting with certain modifications the requirements as to composition contained in the previous Order and they make Food and Drugs Authorities now responsible for the enforcement of the Regulations. Apart from certain specified exceptions all flour (except flour containing the whole of the products derived from the milling of wheat) must now contain Creta Praeparata of a specified fineness in an amount between 235 to 390 mgms. per 100 grams of flour. In addition, all flour is also required to contain the three other nutrients in the amounts previously prescribed, *i.e.*, Iron not less than 1·65 mgms. per 100 grams, Vitamin B_1 not less than 0·24 mgms. per 100 grams and Nicotinic acid or Nicotinamide not less than 1·60 mgms. per 100 grams. These nutrients must be added (when addition is necessary) in the case of Iron as reduced Iron or ferric ammonium citrate and, in the case of Vitamin B_1, Nicotinic acid and Nicotinamide, in a form conforming to the standards of the B.P. or B.P.C. These new Regulations implement the Government's decision to accept the main conclusions in the report of the Panel on the Composition and Nutritive Value of Flour which was published on the 17th May, 1956. The Regulations, however, only cover the points which have been enumerated above and further Regulations may ultimately be considered

necessary. With this in mind the Ministry of Agriculture, Fisheries and Food together with the Ministry of Health and the Department of Health for Scotland published a Press notice on the 7th August, 1956, in which they stated that the Food Standards Committee had now been invited to give consideration to other aspects of the composition of both flour and bread.

During the year under review 48 samples of flour (42 County)were submitted for examination. In addition, 40 samples of self-raising flour (28 County and 12 from Autonomous Authorities) were also examined.

Of the 48 samples of flour eight County samples were reported upon adversely ; three were deficient in Creta Praeparata ; three were deficient in Creta Praeparata and Iron ; one was deficient in Creta Praeparata, Iron and Vitamin B_1 and one contained excess calcium carbonate. The deficiences found in five of the samples were only slight and no action was advised. With regard to the three remaining samples : No. N.4974 contained only 7 ounces of Creta Praeparata per 280 lbs. and only 1·05 mgms. of Iron and 0·15 mgm. of Vitamin B_1 per 100 grams. No. E.7305 contained only 1·7 ounces of Creta Praeparata per 280 lbs. and only 0·8 mgm. of Iron per 100 grams while No. E.8266 was found to contain as much as 820 mgms. of calcium carbonate per 100 grams of flour (the maximum quantity permitted by the Flour (Composition Regulations being 390 mgms. per 100 grams of flour). The first two of these three unsatisfactory samples were submitted for examination before the date upon which the Flour (Composition) Regulations, 1956, came into operation and the results of the examinations of samples Nos. N.4974 and E.7305 were, therefore, brought to the notice of the Ministry of Agriculture, Fisheries and Food. The manufacturers of sample No. E.8266 were communicated with direct and they gave an assurance that they would, in future, do everything possible to avoid a recurrence of an excess of calcium carbonate by trying to secure a more even distribution of Creta Praeparata in their product.

Self-raising flour is required under the Food Standards (Self-Raising Flour) Order, 1946, to yield not less than 0·40 per cent. of available carbon dioxide and it is interesting to note that the 40 samples examined during the year 1956 all complied with this standard.

Details of all the County samples reported upon adversely will be found in table 24.

Samples Containing Extraneous Matter.

During the year under review 17 samples (nine County and eight from Autonomous Food and Drugs Authorities) were reported upon adversely because they were found upon examination to contain foreign bodies. In addition, a further six samples which were found to contain

extraneous matter were submitted under the heading of miscellaneous samples and are mentioned in Part V of this report. The nine County food and drugs samples were was follows : Milk, Sample No. S.6455. This informal sample of school milk in a one-third pint bottle was submitted on complaint and it was found upon examination to contain a number of black fragments containing carbon particles which were probably derived from paper ash ; the vendor was cautioned. Milk, Sample No. N.5543. This informal sample of school milk was also submitted as the result of a complaint and it was found to contain numerous fragments of broken glass weighing in all 15·2 grammes. Legal proceedings were instituted against the dairy concerned and the defendants were fined £25 and £11 11s. costs. Sample No. M.6965 which consisted of part of a Sliced Brown Loaf was found upon examination to contain numerous discolourations throughout the bread which proved to be due to the presence of 32 fragments of rusty fine iron or steel turnings weighing in all 0·21 gramme. The results of the examination of this sample were reported to the food and drugs authority of the area in which the bread had been made. Sample No. E.3707 consisted of part of a Custard Tart which was found upon examination to contain a piece of two-ply twine $4\frac{3}{4}$ inches long probably derived from a flour sack. The vendor was cautioned. Sample No. E.7776, Compound Liquorice Powder. This pre-packed sample was found upon examination to be infested with fungus ; it had also caked into a hard mass and was obviously old stock which had been kept under poor storage conditions. The remainder of the stock was withdrawn from sale. Sample No. E.7969, which consisted of a part bottle of Lemonade, was submitted as the result of a complaint that it had an unpleasant odour. Upon analysis it was found to contain a faint trace of sulphuretted hydrogen (0·09 part per million). The general appearance of the label on the sample suggested that it was old stock and the presence of sulphuretted hydrogen was almost certainly due to the action of the citric acid in the sample on the vulcanised composition stopper of the bottle. The manufacturers were cautioned. Sample No. 1 consisted of an opened can of Celery and was submitted by the Chief Public Health Inspector of a County District following a complaint. Upon examination it was found to contain an irregularly shaped mass of buff coloured material weighing 1·2 grammes which proved upon analysis to consist of chewing gum. The packers of this commodity were cautioned by the Public Health Authority concerned. Sample No. C.6614 consisted of three Slices of Bread from a loaf, two of the slices contained small discoloured areas in the crumb of the bread which proved to be due to iron oxide and carbon and not to dirty lubricating oil. The bakers concerned were cautioned. Lastly a sample of Coloured Acetic Acid, No. N. 6570, which had been taken from a consignment supplied to a caterer was submitted on complaint that it had an

unusual taint. The sample was found to contain 12 per cent. of acetic acid and it had a faint but distinct odour resembling that of turpentine. There was, however, no visible contamination and the amount of turpentine or other essential oils present was not more than 16 parts per million. The packers were communicated with and they undertook to take steps to avoid any contamination occurring in future.

Samples Containing Insects or Insect Remains.

Eleven samples came under this heading during the year under review of which 10 were submitted by County Sampling Officers. Two samples of Cocoa, Nos. S.7420 and S.7515, were found to contain, in the first case, live and dead beetles (niptus hololeucus), and in the second case a beetle (ptinus tectus) and an empty insect cocoon. The remainder of the stocks concerned were surrendered for destruction. Two samples of Oatmeal, Nos. E.7655 and S.7519, contained, in the case of the first sample, numerous live mites and live insect larvae together with dead beetles and dead moths, the second sample contained two live beetles; the results of the examination of these two samples was reported to the Local Sanitary Authority of the area in which the purchases were made. A sample of Barley, No. S.7471, was found to contain numerous live mites and the stock was withdrawn from sale. Sample No. E.7612, which consisted of two Slices of Bread, contained fragments of an insect resembling a steam fly (blatella germanica). The bakers concerned were cautioned. A sample of pre-packed sweetened cake mixture, No. E.8115, was found to contain empty insect cocoons and two dead moths. The remainder of the stock of this commodity was surrendered by the shopkeeper and destroyed. An informal sample of Pork Sausages, No. S.7623, was found, when it was submitted to the Laboratory, to be contaminated with blow-fly eggs and this was brought to the notice of the Local Sanitary Authority of the area in which the sample had been purchased. A sample of lentils, No. E.8240, was found upon examination to contain live mites and it was suggested that the remainder of the stock be examined with a view to it being cleaned.

The Pharmacy and Medicines Act, 1941.

It is the duty of the Pharmaceutical Society to enforce the provisions of Sections 8, 9 and 11 of this Act. A food and drugs authority may also enforce the provisions of these sections of the Act but it is not laid down that it is the duty of such an authority to do so. Briefly, Section 8 prohibits the use of labels, advertisements, etc., which are calculated to lead to the use of an article for the treatment of human beings for certain specified diseases, including tuberculosis; Section 9 prohibits advertisements relating to abortion and Section 11 requires on the label a printed

disclosure of the quantitative composition of any article sold by retail which consists of or comprises a substance recommended as a medicine. For some years after this Act came into operation there was some uncertainty on the part of both enforcing authorities and manufacturers as to the exact significance of the words " substance recommended as a medicine " in relation to both the names used and the instructions given on labels, etc., for the use of articles, and whether or not a disclosure of composition was required. This matter was ultimately clarified by the test case of Potter and Clarke, Ltd. *v.* The Pharmaceutical Society of Great Britain which went to the High Court in Octoberr 1946, and subsequently to the Court of Appeal in April, 1947.

During the year under review two samples were submitted by a County Sampling Officer which are of special interest from the point of view of the above Act.

Asthma Medicine.—Sample No. E.7677.

This informal sample was purchased from a Herbalist's shop and the label on the bottle simply stated " The Mixture " and gave directions for taking it and the name and address of the vendor. There was no formula on the bottle although, at the time it was purchased, the vendor had a window display consisting of a number of similar bottles, near each of which was a display card bearing the name of a complaint or disease. The vendor was communicated with and informed that it was considered that the form of window display used constituted a recommendation as a medicine and that the various medicines to which it applied should comply with the requirements of Section 11 of the Pharmacy and Medicines Act in that the labels on the bottles should give a disclosure of composition in the form required by the Act. The vendor in reply stated that the medicines were made up and supplied in accordance with the needs of each particular customer and did not always contain the same quantity and type of ingredient in every bottle for each complaint. Made up and prescribed in this way medicines are exempted from the requirements of Section 11 of the Act by the last paragraph of sub-section (1) of that Section but it was pointed out that in this particular instance there was a window display and recommendation which appeared to be of a general nature and therefore not directed to the needs of a particular person. The vendor was advised to discontinue this particular form of window display and then, so long as he supplied each bottle only for the needs of a particular person he would be complying with the requirements of the Pharmacy and Medicines Act. It was further suggested that the vendor should communicate with the Secretary of the Pharmaceutical Society and obtain the opinion of the Society on the matter.

Cod Liver Oil.—Sample No. E.8158.

The bottle containing this informal sample was completely filled with the Cod Liver Oil and was enclosed in a carton accompanied by very extensive literature relating to the commodity. *Inter alia*, a claim was made that " . . . Pulmonary Complaints and all kinds of Lung Affections in young and old are speedily removed . . ." and ". . . gives increased protection against epidemics and wasting diseases such as consumption." These statements are clearly contraventions of Section 8 of the Pharmacy and Medicines Act. Further claims that " it is a natural, not an artificial food supplying Vitamins A and D " and ". . . is refined by a special process retaining the fat soluble Vitamin A and antirachitic Vitamin D, also its high Iodine and Bromide values remain unimpaired " were not accompanied by a statement of the minimum quantities of the vitamins and minerals present in each fluid ounce of the Cod Liver Oil as required by Section 9 of the Labelling of Food Order. Upon analysis the sample was found to comply with the requirements of the British Pharmacopoeia as regards its Vitamin A content and the acid value of the oil was only slightly in excess of the B.P. maximum limit ; *viz.* 1·6 instead of 1·2. Also enclosed with the other literature was a printed notice drawing attention to the scarcity of Cod Liver Oil due to the war. The vendor was interviewed and he stated that this particular commodity was several years old but he was unable to state precisely its age because it was on the premises before the existing staff took over. From all the circumstances it would appear that the sample was war-time stock and was probably packed before the Pharmacy and Medicines Act came into operation in the year 1941. The condition of the oil itself, considering the number of years it had probably been packed, says much for the advantages of protecting this type of commodity from light and air during storage. The small remaining stock was surrendered by the vendor for destruction.

Aspirin Tablets and Compound Tablets of Codeine.

The British Pharmacopoeia 1953 and its Addendum 1955 contain monographs on several tablets, the compositions of which include aspirin (acetylsalicylic acid) as an active constituent. Probably the best known of these from the point of view of the purchasing public are : (*a*) aspirin tablets B.P. which unless otherwise stated contain in each tablet 5 grains of acetylsalicylic acid (limits 94·5 to 105·0 per cent. of the stated amount). The B.P. monograph includes an official assay and a limit test for salicylic acid ; (*b*) soluble aspirin tablets B.P. which contain in each tablet 5 grains of acetylsalicylic acid (limits 95·0 to 105·0 per cent. of the specified quantity) together with specified amounts of calcium carbonate, citric acid and saccharin sodium. The British Pharmacopoeia monograph on

this tablet also includes an official assay and a limit test for salicylic acid ; (*c*) compound tablets of codeine B.P. contain in each tablet 4 grains of acetylsalicylic acid (limits 94·5 to 105·0 per cent. of the specified amount), 4 grains of phenacetin (limits 95·0 to 105·0 per cent.) and $\frac{1}{8}$th grain of codeine phosphate (limits 92·5 to 107·5 per cent.). An official assay is given for each of the above ingredients. There are two other official tablets containing aspirin in the British Pharmacopoeia and three more in the British Pharmaceutical Codex ; there are in addition, of course, numerous proprietary makes of tablets which also include aspirin as an active constituent. The limiting values for the amounts of the active constituents mentioned above are operative when the assay has been carried out on 20 tablets ; if less than 20 tablets are available but, in any case, not less than five tablets, then to allow for possible sampling errors, the B.P. specifies that the limiting values may be altered by prescribed amounts. The British Pharmacopoeia also requires tablets to comply with certain requirements as to uniformity of weight and to pass a disintegration test. This last test has been modified and made more precise in the Addendum 1955 to the B.P. Formerly it was carried out simply by repeatedly inverting a test tube containing water and the tablets, now a special apparatus is required and the tablets are moved up and down through water at a prescribed rate and they must disintegrate sufficiently for all the particles to readily pass, within a prescribed time, through the apertures in a disc of rustproof wire gauze complying with the requirements for a No. 10 sieve.

During the year under review the County Sampling Officers submitted for examination 12 samples of Compound Codeine Tablets, two samples of Aspirin Tablets for Children and one sample of Buffered Aspirin Tablets. In addition, two samples of ordinary Aspirin Tablets B.P. were submitted by Autonomous Food and Drugs Authorities. With the exception of one sample of compound codeine tablets and one sample of childrens aspirin tablets all the samples were reported to be satisfactory. An informal sample of compound codeine tablets, No. N.6391, was found to comply with the requirements of the British Pharmacopoeia as to composition but it failed to pass the new disintegration test in that, although the greater part of the tablets disintegrated rapidly, a number of fairly large particles were left which did not pass through the wire gauze disc in the prescribed time of 15 minutes. The manufacturers were communicated with and it appeared from the correspondence that they might still be using the disintegration test of the 1953 B.P. which does not require the use of a wire gauze ; under this less stringent test the tablets would appear to disintegrate rapidly and the presence of some relatively large particles might not be noticed. It was suggested by the manufacturers that the trouble was due to the use of a coarser sieve than normal for the granulation. The remaining unsatisfactory sample was

of aspirin tablets for children, No. C.5574, this consisted of soluble aspirin tablets each containing $1\frac{1}{4}$ grain of acetylsalicylic acid together with calcium carbonate and citric acid. While the amount of aspirin present was correct, the tablets contained a very high proportion of free salicylic acid, corresponding to 1·8 per cent. of the aspirin content or approximately eleven times the B.P. permitted limit for salicylic acid in soluble aspirin tablets. Both the retailer and the manufacturer were communicated with and the stock, which was of very old manufacture, was withdrawn from sale.

Cod-Liver Oil, Extract of Malt, Extract of Malt with Cod-Liver Oil and Emulsion of Cod-Liver Oil.

The above commodities are the subjects of monographs in the British Pharmacopoeia, 1953, and these have not, in any way, been amended by the Addendum to the British Pharmacopoeia published in 1955. They are also foods and may, therefore, come within the labelling requirements of both the Labelling of Food Order and the Pharmacy and Medicines Act as well as having to comply with the standards of the B.P. This point, however, has been the subject of the following rulings: (1) the definition of "food" in the Food and Drugs Act, 1955, only excludes those drugs which are "articles or substances used only as drugs." (2) The Ministry of Food ruled, as far back as the year 1944, that Cod-Liver Oil and Extract of Malt with Cod-Liver Oil were not subject to the requirements of the Labelling of Food Order provided that no claim or indication was given that the products were foods. (3) The First Report of the Definition of Drugs Joint Sub-Committee of the Standing Medical, Pharmaceutical and General Practitioner Advisory Committees made to the Minister of Health in 1950, for the guidance of general practitioners when prescribing drugs, stated that Cod-Liver Oil and Extract of Malt with Cod-Liver Oil may be regarded as drugs when used for the treatment, for example, of tuberculosis or vitamin deficiency but were to be regarded as foods when used as a routine measure for healthy persons. The British Pharmacopoeia uses the description "Extract of Malt with Cod-Liver Oil" and thereby follows the normal requirement of the Labelling of Food Order that the ingredient present in the greater proportion, *i.e.*, Extract of Malt, should be named first. This was the practice in the British Pharmacopoeia long before the Labelling of Food Order was made; yet, in two of the rulings to which reference is made above this product is decribed as "Cod Liver Oil and Malt" and "Cod-Liver Oil and Malt Extract."

With regard to Standards, the British Pharmacopoeia requires Cod-Liver Oil to contain not less than 600 units of Vitamin A activity per gramme and not less than 85 units of antirachitic activity (Vitamin D) per gramme. It is interesting to note that the 1953 Pharmacopoeia

requires the assay of Vitamin A to be carried out by a spectrophotometric method ; whereas the 1948 Pharmacopoeia gave both a biological and a spectrophotometric method for this assay, the spectrophotometric assay then being regarded as subsidiary to the biological assay. Extract of Malt of the Pharmacopoeia is required to contain Nitrogen equivalent to 4·0 per cent. w/w of protein and to pass a limit test for Lipase. Extract of Malt with Cod-Liver Oil must contain 10·0 per cent. w/w of Cod-Liver Oil (limits 9·3 to 10·7) and both its ingredients should, of course, be of B.P. quality. It should be noted, however, that while the maximum limit for the acid value of cod-liver oil, per se, is 1·2, the limit for the acid value of the oil obtained in the assay of Extract of Malt with Cod-Liver Oil can be as high as 10. Emulsion of Cod-Liver Oil B.P. is required to contain 50 per cent. v/v of Cod-Liver Oil but there are numerous proprietary emulsions on the market containing Cod-Liver Oil and other ingredients in varying declared amounts.

During the year 1956, 11 samples of Cod-Liver Oil, one sample of Malt Extract, eight samples of Extract of Malt with Cod-Liver Oil and two samples of Cod-Liver Oil emulsion were submitted for examination. With the exception of two samples of Extract of Malt with Cod-Liver Oil all the above were submitted by County Sampling Officers.

One sample of Cod-Liver Oil and three samples of Extract of Malt with Cod-Liver Oil (one submitted by an Autonomous Food and Drugs Authority) were reported upon adversely. The two samples of Cod-Liver Oil emulsion were proprietary brands ; upon analysis their composition was found to agree with the declaration on the label and they were both reported as genuine. The unsatisfactory sample of Cod-Liver Oil, No. E.8158, was of very old stock. It was not quite up to B.P. standard due to deterioration with age and its label did not conform to the requirements of either the Pharmacy and Medicines Act or the Labelling of Food Order ; this sample is discussed in some detail in the section of the Report dealing with the Pharmacy and Medicines Act. An informal County sample of Extract of Malt with Cod-Liver Oil, No. N.5776, was found upon examination to contain Cod-Liver Oil which had an acid value of 60, instead of not more than 10 as required by the B.P. ; furthermore, the label on this sample did not bear the name and address of the packer or vendor as required by the Labelling of Food Order. The vendor and his suppliers were communicated with and, as a result, the vendor's stock was replaced and the remainder of the bulk consignment, amounting to approximately 8½ cwt., was returned to the makers. The second unsatisfactory County sample of Extract of Malt with Cod-Liver Oil, No. N.5778, was found, upon analysis, to contain 3·3 per cent. of protein which, after allowing for the amount of Cod-Liver Oil present, is equivalent to 3·7 per cent. protein in the Extract of Malt used in its manufacture.

Extract of Malt of B.P. quality, however, is required to contain not less than 4·0 per cent. of protein. The manufacturers were communicated with and they replaced the retailer's remaining stock which was, of course, withdrawn from sale. The remaining unsatisfactory sample of Extract of Malt with Cod-Liver Oil was submitted by an Autonomous Food and Drugs Authority. The acid value of the Cod-Liver Oil extracted in the assay was found to be 22, which is higher than the maximum B.P. limit of 10. In this instance also, the manufacturers agreed to replace the vendor's stock.

Penicillin Preparations.

Amorphous penicillin of the British Pharmacopoeia occurs as the calcium salt, the potassium salt or the sodium salt. It consists of a mixture of penicillins of which five predominate and of these Benzylpenicillin is the most important in that it is this form which is required to be dispensed or supplied when " Penicillin " is prescribed. Benzylpenicillin (Crystalline Penicillin G) is supplied as the crystalline potassium or sodium salt which has had impurities and salts of other penicillins removed as completely as possible. In addition to the above, a compound of Benzylpenicillin, *i.e.*, Procaine Benzylpenicillin is also included in the British Pharmacopoeia. This salt of penicillin is sparingly soluble and it is used when it is necessary to release penicillin slowly over a longer period than usual into the blood stream.

The official preparations of the British Pharmacopoeia which are made from either Amorphous Penicillin or Benzylpenicillin include a cream, an eye ointment, an injection, a lozenge and an ointment. Tablets are made only from Benzylpenicillin. The two preparations of Procaine Benzylpenicillin official in the British Pharmacopoeia are an injection and another injection containing both Procaine Benzylpenicillin and Benzylpenicillin. In addition to the above the British Pharmaceutical Codex lists solution-tablets containing either Amorphous Penicillin or Benzylpenicillin, a sterilised cream containing Benzylpenicillin and eye-drops of Benzylpenicillin.

The official assays of Benzylpenicillin are carried out by chemical methods but the determination of the potency of Amorphous Penicillin, Procaine Benzylpenicillin and certain of the preparations of penicillin is carried out by a micro-biological method using a susceptible strain of B. subtilis and comparing the dose of the sample with the dose of a standard preparation of penicillin which produces the same degree of inhibition of the micro-organism. The potency is returned in terms of units of penicillin. The unit at present in use being the specific activity contained in 0·0005988 mg. of the Standard Preparation of the dried crystalline sodium salt of Benzylpenicillin. The British Pharmacopoeia directs that penicillin and its water-free preparations should be stored in sealed or

well-closed containers, protected from moisture and kept cool. Warning is given that the cream and injection of penicillin, which of course contain water, deteriorate rapidly in potency on keeping. The 1955 Addendum to the British Pharmacopoeia, 1953, has amended the storage requirement for tablets of penicillin so that it now reads " Tablets of Penicillin are packed in a suitable well-closed container which prevents the access of moisture and should be stored in a cool, dry place. They deteriorate on exposure to moist air." In addition, penicillin tablets are now required to lose not more than 1·0 per cent. of their weight when dried over P_2O_5 at a pressure not exceeding 5 mm. of mercury for twenty-four hours.

During the year under review 17 samples of Penicillin Tablets B.P. were submitted for examination, all by County Sampling Officers. One of the samples was reported upon adversely. The British Pharmacopoeia directs that if the number of units of penicillin to be contained in a tablet is not specified then tablets containing, in each, 200,000 Units shall be dispensed. All the samples submitted were obtained on prescriptions specifying the normal B.P. tablet of 200,000 Units per tablet but the one unsatisfactory sample No. C.6595 was found upon examination to consist of tablets containing only 100,000 Units per tablet. The vendor of this sample was communicated with and he stated that the error had occurred because he had been firmly of the opinion that the branded tablets supplied were of the normal strength. He gave an assurance that this mistake would not occur again.

Seidlitz Powders.

In addition to the usual seidlitz powder, or compound effervescent powder, of the British Phrmacopoeia there are two other seidlitz powders included in the British Pharmaceutical Codex, *i.e.*, a double-strength seidlitz powder and an extra-strong seidlitz powder. These powders each consist of two packets, a definite weight of sodium potassium tartrate (Rochelle salt) mixed with 2·5 grams of sodium bicarbonate wrapped in blue paper and 2·5 grams of tartaric acid wrapped in white paper. The amounts of sodium bicarbonate and tartaric acid are constant for all sedlitz powders but the strength of the powder is varied by altering the amount of Rochelle salt in accordance with the following table ; it will be noted that the extra-strong powder is mid-way in composition between the ordinary seidlitz powder and the double-strength seidlitz powder :—

Type of Seidlitz Powder.	Amount of Rochelle Salt.
Seidlitz Powder B.P.	... 7·5 grams.
Extra-strong Seidlitz Powder B.P.C. ...	... 11·25 grams.
Double-strength Seidlitz Powder B.P.C.	... 15·0 grams.

During the year under review nine samples of seidlitz powder B.P., two of extra-strong seidlitz powder B.P.C., and two of double-strength seidlitz powder B.P.C., were submitted for examination, all by County

Sampling Officers. One sample of seidlitz powder and one of double-strength seidlitz powder were reported upon adversely. An informal sample, No. C.6279, of seidlitz powder B.P. which was submitted for analysis consisted of three powders. One of the powders was correctly dispensed but in respect of the remaining two powders both the blue packets were overwieght, being 10·64 grams and 10·82 grams respectively, and one of the white packets was overweight, being 2·97 grams. The British Pharmacopoeia specifies limits of 9·5 to 10·5 grams for the blue packets and 2·25 to 2·75 grams for the white packets. The vendor was communicated with, and he in turn, brought this matter to the notice of the manufacturer to whom the remainder of the stock was returned. The manufacturer had this stock analysed and confirmed the results obtained by your Analyst. The powders had been weighed out on an automatic weighing machine and the discrepancies found could have been due to incorrect procedure by the operator. The vendor's stock was replaced and the manufacturer expressed regret that this error had occurred. The remaining unsatisfactory sample, No. N.6001, was purchased as a sample of double-strength seidlitz powders. The sample consisted of three powders which upon examination were found to conform to the requirements of the ordinary strength seidlitz powder of the British Pharmacopoeia and they were not, therefore, double-strength seidlitz powders as formulated in the British Pharmaceutical Codex. The vendor of this sample was interviewed and cautioned. Some two months later a further satisfactory sample of ordinary strength seidlitz powder B.P. was obtained from this shop and on that occasion the assistant stated that they did not stock the double-strength powder.

Nasal Inhalers.

These are used to relieve catarrh and other similar conditions. The Inhaler usually contains a stated amount of amphetamine or of menthol, camphor, etc. Amphetamine is the subject of a monograph in the British Pharmacopoeia and it is (±) −2−aminopropylbenzene. This amine is a liquid which slowly volatilises at ordinary temperatures. It is alkaline in reaction and readily soluble in acids and these characteristics form the basis of the official assay. Other brand names for amphetamine are Allodene and Benzedrine. This substance acts like adrenaline in producing shrinkage of congested nasal mucous membrane but if used excessively it can cause undesirable symptoms. In view of the fact that amphetamine and other substances used in inhalers are slowly volatile, it follows that, if not stored efficiently, the inhalers may lose strength before they are purchased and they should always be kept closed with an air-tight cap when not in use.

During the year under review 11 nasal inhalers were submitted for examination, 10 by County Sampling Officers, and of these, 10 contained amphetamine and one contained a mixture of menthol, camphor, certain essential oils, etc. The amounts of amphetamine declared to be present in each inhaler containing it varied from 0·325 gram to 0·351 gram. Two of the amphetamine inhalers, samples Nos. N.5457 and N.5627, both obtained from the same stock at one shop were reported upon adversely in that they were found upon analysis to contain only 0·146 and 0·147 gram of amphetamine respectively against a declaration of 0·330 gram. The second of these two samples was the last of the existing stock at the shop and on enquiry by the Sampling Officer it transpired that this was at least 18 months old. The manufacturers were communicated with and they stated that they had endeavoured to maintain a constant turnover of inhalers and they had adopted a system of coding to check the date of manufacture. In view of the discrepancies found in the two samples the manufacturers decided to discontinue making inhalers of this type.

Prosecutions.

When the adulteration of a sample is considered to be sufficiently serious, legal proceedings are instituted. Prosecution, however, is only one of the means of dealing with adulterated or otherwise unsatisfactory samples. A perusal of tables 11 and 24, which are concerned with the various types of milk adulteration and sophisticated samples other than milk, respectively, shows that many of the samples are only slightly adulterated. In the case of food and drug samples, other than milk, deterioration may be due to long storage or adulteration may be brought about by the action of some person other than the actual vendor. In these instances it is often considered appropriate to take less drastic action than legal proceedings. In the case of milk samples vendors are sometimes cautioned and subsequent samples then frequently prove to be genuine ; in other instances dairies are visited by the Sampling Officers in order to correct faulty dairy management which has given rise to unsatisfactory samples. In the case of other foods and drugs appropriate action may take the form of the surrender for destruction of the remainder of any unsatisfactory stocks, returning stocks to manufacturers or communicating with packers with regard to unsatisfactory labels, etc.

During the year a total of 340 County food and drugs samples were reported upon adversely and in respect of 18 of these prosecutions were instituted, 13 in respect of milk samples, two in respect of Jersey Milk, and three in respect of salmon paste. In addition, there was one prosecution under Section 2 of the Food and Drugs Act, 1955, in respect of two samples of raw milk represented to be pasteurised milk and one under Section 37, Food and Drugs Act, 1955, in respect of two samples of raw milk sold in a specified area in the County. There were 19 convictions or

orders to pay costs and in the one remaining instance, the summons was dismissed although the analytical findings were not questioned. The total fines and costs during the year amounted to £185 13s. 6d., a figure which is the lowest since the year 1940. In table 26 will be found similar information to the above for the years 1912 to 1956 inclusive.

Table 26.

County Fines and Costs during the Years 1912–1956.

Year.	Number of Prosecutions.	Convicted or ordered to pay costs.	Dismissals, etc.	Fines and Costs. £ s. d.
1912–1935 ...	1504	1302	202	6,239 1 7
1936 ...	22	20	2	107 14 9
1937 ...	39	36	3	165 1 0
1938 ...	26	24	2	132 10 1
1939 ...	19	18	1	100 11 6
1940 ...	25	23	2	171 14 0
1941 ...	84	79	5	824 13 2
1942 ...	38	36	2	502 4 10
1943 ...	54	49	5	375 10 11
1944 ...	38	37	1	291 19 6
1945 ...	33	33	0	365 4 6
1946 ...	94	92	2	936 7 9
1947 ...	98	93	5	667 7 0
1948 ...	70	69	1	703 0 6
1949 ...	48	45	3	518 17 2
1950 ...	43	42	1	405 8 7
1951 ...	50	39	11	362 11 6
1952 ...	65	64	1	620 13 0
1953 ...	54	53	1	576 12 8
1954 ...	45	45	0	294 9 6
1955 ...	42	41	1	261 7 6
1956 ...	20	19	1	185 13 6
Total ...	2,511	2,259	252	14,808 14 6

Table 27.

Prosecutions arising out of Samples purchased during the year 1956.

District.	Number of Prosecutions.	Convicted or ordered to pay Costs.	Dismissals, etc.	Fines and Costs. £ s. d.
Bacup Borough	1	1	...	3 1 0
Burnley R.D.C.	2	2	...	31 6 0
Chadderton U.D.C.	1	1	...	10 19 0
Denton U.D.C.	2	2	...	27 7 0
Droylsden U.D.C.	1	1	...	6 15 0
Farnworth Borough	2	1	1	12 6 0
Fulwood U.D.C.	1	1	...	6 18 0
Garstang R.D.C.	2	2	...	8 10 0
Haslingden Borough... ...	1	1	...	1 1 0
Leyland U.D.C.	1	1	...	36 11 0
Orrell U.D.C....	1	1	...	11 6 0
Oswaldtwistle U.D.C. ...	3	3	...	8 9 6
Urmston U.D.C.	1	1	...	12 0 0
Whitefield U.D.C.	1	1	...	9 4 0
County Districts	20	19	1	185 13 6
Autonomous Authorities ...	2	2	...	18 7 0
Total.—All sources	22	21	1	204 0 6

PART II.—THE MILK (SPECIAL DESIGNATION) (PASTEURISED AND STERILISED MILK) REGULATIONS, 1949 TO 1953.

Phosphatase Test, Half-hour Methylene Blue Test and Turbidity Test.

The above Regulations applying to heat-treated milk (as distinct from other Regulations relating to raw milk) were made jointly by the Minister of Health and the Minister of Food. The Regulations, besides relating to pasteurised milk, also provide for the special designation " sterilised milk."

The special designations for heat-treated milk are " Pasteurised " and " Sterilised " but in appropriate circumstances the designations " Tuberculin Tested Milk (Pasteurised) " and " Tuberculin Tested Milk (Sterilised) " may also be used.

Food and Drugs Authorities are responsible for the granting of pasteurising and sterilising licences but Local Authorities are responsible for all other licences required by the Regulations. The duties of Food and Drugs Authorities include the inspection of records, the inspection of the arrangements for processing milk and the taking of samples in respect of all plants for which licences have been granted.

An amendment to the Milk (Special Designation) (Pasteurised and Sterilised Milk) Regulations which came into operation on the 20th December, 1953, required the compulsory use of overlapping caps on all containers of pasteurised milk from the 1st October, 1954. It will be remembered that this same date was fixed in the principal Regulations for the operation of the requirement that pasteurised milk must be put into the containers in which it is to be delivered to customers on the premises at which it has been pasteurised. It follows from this that the bottling of pasteurised milk from churns by retailers and the sale of pasteurised milk by measure from a can are now both illegal. The amending Order also permits sterilised milk to be processed in cans and other containers of a capacity of not more than one gallon as well as in bottles.

Pasteurised milk must be treated by one or the other of the following processes :—

(*a*) Retained at a temperature of not less than 145°F. and not more than 150°F. for at least 30 minutes and be immediately cooled to a temperature of not more than 50°F. ; or

(*b*) Retained at a temperature of not less than 161°F. for at least 15 seconds and be immediately cooled to a temperature of not more than 50°F. ; or

(*c*) Retained at such temperature for such period as may be specified by the licensing authority with the approval of the Minister.

It will be noted that the temperature of 161°F given in (*b*) is 1°F lower than that originally specified ; the Minister of Food stated that this change would improve the " cream line " of the milk without, on present evidence, causing any risk to health.

Sterilised milk must be filtered or clarified, homogenised and heated to and maintained at such a temperature, not less than 212°F., for such a period as to ensure that it will comply with the turbidity test prescribed.

The Regulations state that samples may be taken at any time while the milk is in the possession of the processor or of the licensed dealer. Unopened bottles should be taken as samples where possible but where the milk is in bulk (exceeding 1 quart) it may be sampled into sterile bottles. All samples must be carried in insulated containers (not artificially cooled) and they must arrive at the laboratory on the day of sampling.

Three tests are prescribed, a phosphatase test and half-hour methylene blue test for pasteurised milk and turbidity test for sterilised milk. Samples intended for examination by the phosphatase test must be stored in the laboratory at a temperature of between 32°F and 40°F while samples intended for the methylene blue test must be stored at the laboratory at an atmospheric shade temperature not exceeding 65°F. No storage temperature is prescribed for samples of sterilised milk.

The phosphatase test depends on the liberation of free phenol from the salt disodium phenyl phosphate by the enzyme phosphatase. This enzyme is always present in raw milk but is almost entirely destroyed by the amount of heat-treatment necessary for efficient pasteurisation, *i.e.*, necessary for the destruction of m-Tuberculosis and other pathogenic micro-organisms. The amount of phenol liberated in the test is an approximate but not directly proportionate measure of the phosphatase remaining in the milk ; a high result indicating insufficient heat-treatment or the presence of raw milk. The test is extremely delicate and it is essential that great care be exercised in collecting the samples for submission to the test, in testing the purity of the reagents used and in the actual carrying out of the test.

The methylene blue test depends on the decolorisation of methylene blue by bacteria and reducing substances present in milk. If under the conditions of the test, decolorisation occurs in less than 30 minutes it is deemed that there has been such a development of bacteria and reducing substances in the milk as to render its keeping quality unsatisfactory. The test is designed to ensure that milk will keep fresh, if kept reasonably cool, until the next day's supply is received by the consumer and with that end in view samples, before examination in the laboratory, are not kept in a refrigerator but are merely kept at atmospheric shade temperature not exceeding 65°F. It should be noted that the half-hour methylene blue test prescribed by these Regulations is quite different from the methylene blue test prescribed in the Milk (Special Designation) (Raw Milk) Regulations, 1949, in relation to raw designated milks.

The turbidity test for sterilised milk is based upon the fact that heating to not less than 212°F for a period sufficient for effective sterilisation will also completely denature all the soluble protein of the milk. Samples which show the presence of soluble protein under the conditions of the test are insufficiently heated or contain raw milk.

The Milk (Special Designations) (Specified Areas) Orders 1952 to 1956.

It will be recalled that following the publication of a government memorandum on Measures to Improve the Quality of the Nations Milk Supply the Minister of Food was given power under Regulation 55 G of the Defence (General) Regulations, dated 20th January, 1944, to restrict the sale of raw milk within any area which had been specified for that purpose in an Order made by the Minister. Before an area could be made a specified area it was, of course, necessary for the Minister to satisfy himself that adequate plant was available for heat-treating the whole of the milk sold within the area, with the exception of Tuberculin Tested Milk. Similar provisions to the above were included in the Milk (Special Designations) Act, 1949, and Regulation 55 G was then revoked. This Act was, in turn, repealed and replaced by the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950, which came into operation on the 1st January, 1951, and which also consolidated certain other enactments. Section 19 of this Act made it compulsory to use a special designation in respect of all sales of milk by retail for human consumption in an area which has been designated by Order as a Specified Area. The only exceptions refer to certain catering sales and to the sale of milk by a producer to his employees, if, in the latter instance, he does not engage in any other selling of milk by retail. Section 23 of the same Act empowered the Minister of Food to bring into operation by Order the provisions of Section 19 in any area. The special designations which may be used in relation to heat-treated milk in a Specified Area are "Pasteurised," "Sterilised," "Tuberculin Tested Milk (Pasteurised)" and "Tuberculin Tested Milk (Sterilised)." In relation to raw milk the only special designation now permitted is "Tuberculin Tested." The use of the special designation "Accredited" was prohibited in specified areas on and after the 1st October, 1954, by Section 22 of the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950, and the Milk (Special Designation) (Raw Milk) Regulations, 1949, prohibited the granting of Producer's licences to use the special designation "Accredited" after 30th September, 1952.

The preceding paragraph describes the position as regards the making of Specified Areas up to and including the early months of the year 1955 but, due to the making of two Transfer of Functions Orders in the year 1955 and the passing of the Food and Drugs Act, 1955, certain alterations in the law, particularly as to procedure, have since become operative. When the Ministry of Food was dissolved on the 7th April, 1955, the function of the Minister of Food to make Milk (Special Designations) (Specified Areas) Orders was transferred to the Minister of Agriculture, Fisheries and Food and this function was again transferred on the 6th July, 1955, to the Minister of Agriculture, Fisheries and Food and the Minister of Health acting jointly following the making of the Transfer

of Functions (Food and Drugs) Order, 1955. Due to the coming into operation of the Food and Drugs Act, 1955, on the 1st January, 1956, Sections 19, 22 and 23 of the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950 (which relate to the compulsory use of special designations in Specified Areas, the abolition of the special designation "Accredited" and the function of the Ministers to make Milk (Special Designations) (Specified Areas) Orders) have now been replaced by Sections 37, 40 and 41 respectively of the 1955 Act.

The first Milk (Special Designations) (Specified Areas) Order which affected part of the area of the County Food and Drugs Authority came into operation on the 1st November,1952. Four other Orders similarly affecting parts of the County came into operation on the 1st January, 1954, the 1st October, 1954, the 6th December, 1955, and the 10th April, 1956, respectively. By the end of the year 1956 a total of 51 of the 92 County districts in the County Food and Drugs area had become specified areas. In view of the fact that it is the duty of the Food and Drugs Authority to enforce the provisions of Section 37 of the Food and Drugs Act, 1955, it follows from the above that an increased number of samples of special designation heat-treated milks are now being taken by County Sampling Officers in the County districts concerned for submission to the County Laboratory for examination by the statutory Phosphatase, Half-hour Methylene Blue or Turbidity tests. In this connection it is interesting to note that a successful prosectuion was instituted against a milk retailer during the year 1956, under Section 2 of the Food and Drugs Act, 1955, in respect of two samples of raw milk represented to be Pasteurised milk. A prosecution was also instituted under Section 37 of the Food and Drugs Act in respect of two samples of raw undesignated milk sold in a Specified Area but the case against the vendor was dismissed as the Court held the view that the sale, insisted on by the Sampling Officer, was not a sale within the meaning of this Section, *i.e.*, it was not a sale of undesignated milk in the course of business for human consumption. A further two samples of raw milk were purchased from another retailer, also by a Sampling Officer under his powers of purchasing samples exercisable under the Food and Drugs Act, but a prosecution was not proceeded with as the view was held that the sale was, in effect, a forced sale and could not, therefore, create an offence under Section 37 of the Act.

During the year, 1,341 samples of milk were submitted for examination by the Phosphatase test and the Half-hour Methylene Blue test or by the Turbidity test. The samples were marked either Pasteurised, Tuberculin Tested (Pasteurised) or Sterilised and tables 28, 29 and 30 give particulars of the results obtained. In addition four samples of raw milk were submitted for examination by the Phosphatase test and the Half-hour Methylene Blue test and, as was to be expected, they failed to pass the Phosphatase test.

With regard to the methylene blue test the Regulations prescribe that it shall be commenced between 9 a.m. and 10 a.m. on the day after the sample was taken and that in the meantime, as already indicated, it shall be kept at the laboratory at atmospheric shade temperature not exceeding 65°F (the sample must not be kept in a refrigerator). During periods of exceptionally warm weather the shade temperature often exceeds the limit specified. Of the numbers reported as unsatisfactory in table 29, 10 samples, submitted by County Sampling Officers, and the three submitted by an Autonomous Authority were kept at shade temperatures exceeding 65°F. and these, therefore, should be deducted from the total number of unsatisfactory samples to arrive at the number failing to pass the statutory test. It should be mentioned, however, that even when the shade temperature exceeds 65°F. a high proportion of the samples still pass the test ; in view of the fact that keeping quality is particularly desirable in warm weather it is unfortunate that the statutory test cannot then be applied. With regard to the turbidity test it will be observed from table 30 that only one county sample of sterilised milk failed to pass the test.

Table 28.

Phosphatase Tests, 1956.

Type of Milk.	Number Submitted.		Number Unsatisfactory.					
			County.			Borough.		
	County.	Borough.	Group II.	Group III.	Total	Group II.	Group III.	Total.
Pasteurised ..	612	91	3	5	8	0	1	1
T.T. (Pasteurised)	399	68	3	2	5	0	0	0
Raw Milk ..	4	0	0	0	0	0	0	0
Totals	1,015	159	6	7	13	0	1	1

Table 29.

Half-hour Methylene Blue Tests, 1956.

Type of Milk.	Number Submitted.		Number Unsatisfactory.	
	County.	Borough.	County.	Borough.
Pasteurised	612	81	7	0
T.T. (Pasteurised) ..	399	67	7	3
Raw Milk	4	0	0	0
Totals	1,015	148	14	3

Table 30.

Turbidity Tests, 1956.

Type of Milk.	Number Submitted.		Number Unsatisfactory.	
	County.	Borough.	County.	Borough.
Sterilised	141	30	1	0
T.T. (Sterilised) ..	0	0	0	0
Totals	141	30	1	0

PART III.—THE FERTILISERS AND FEEDING STUFFS ACT, 1926.

The Fertilisers and Feeding Stuffs Act, 1926, came into force on July 1st, 1928. It is intended to safeguard the purchasers of substances used for the fertilisation of the soil and for the feeding of cattle and poultry.

The general purpose of the Act, like that of the Act of 1906, which it repealed, is to provide civil remedies for the misdescription of, and to prevent fraud in, fertilisers and feeding stuffs. Its scope is defined by Regulations made by the Minister of Agriculture, Fisheries and Food.

In addition, during and since the war, a number of Regulations governing the control and composition of fertilisers and feeding stuffs were made by appropriate Government Departments. In the year 1953, however, the Minister of Food made the Feeding Stuffs (Revocation) Order which came into operation on the 1st August, 1953. The effect of this Order was to revoke all Orders made under the Defence (General) Regulations, 1939, which were concerned with the control of the manufacture, licensing, rationing and prices of Feeding Stuffs. The only statutory control of the composition of Feeding Stuffs now in operation is, therefore, that exercised under the Fertilisers and Feeding Stuffs Act, 1926.

The one exception to the above is that during the years 1953 and 1954, in exercise of powers under Section 2 of the Therapeutic Substances (Prevention of Misuse) Act, 1953, Regulations were made by the Minister of Health which permit the use of certain antibiotics, *viz.*, penicillin, aureomycin and oxytetracycline, in pig foods and poultry foods. These Regulations prescribe conditions with regard to labelling and also specify maximum limits for the amounts of the prescribed antibiotics which may be present.

It has already been mentioned that the scope of the Fertilisers and Feeding Stuffs Act is defined by Regulations. The Regulations operative prior to the year 1956 were the Fertilisers and Feeding Stuffs Regulations, 1932, to which minor amendments had been made in the years 1942 and 1951. In November, 1955, however, the Minister of Agriculture, Fisheries and Food made the Fertilisers and Feeding Stuffs Regulations, 1955, which came into operation on the 1st January, 1956. The new Regulations were discussed in this report for the year 1955 and it will be remembered that they follow, in general, the form of the 1932 Regulations although they have been completely re-drafted and include amendments recommended by the Standing Advisory Committee. Some of these amendments are concerned with changes in methods of analysis but the Standing Advisory Committee is still engaged in carrying out a general review of the prescribed methods and it is expected that from time to time amending Regulations will be made to give effect to the Committee's recommendations. The first of these amending Regulations was made on the 21st November, 1956, and came into operation on the 1st January, 1957. It provides for an alternative method of determining phosphoric acid in fertilisers and feeding stuffs. The method in use prior to the last mentioned date is based upon the usual gravimetric procedure of determination as magnesium pyrophosphate following a preliminary separation by means of molybdic acid ; this method may still be used. The new method is a volumetric one and depends upon the precipitation of the phosphate as quinoline phosphomolybdate followed by titration with standard acid and alkali ; it avoids the four hours standing time required for the precipitation of the magnesium ammonium phosphate in the gravimetric method and the time required for its subsequent ignition to pyrophosphate and it will, therefore, be found to be a much speedier method.

Fifty-one samples have been examined for the County during the year under review. The number of County samples, therefore, has been maintained at the level reached over the previous seven years. Of these, 23 were fertilisers and 28 consisted of feeding stuffs. The fertilisers comprised 21 formal samples and two informal samples. The feeding stuffs all consisted of formal samples.

In addition eight informal samples of fertilisers were examined for Autonomous Authorities.

Of the 23 samples of fertilisers examined for the County 19 were found upon analysis to be correct within the limits of variation permitted by Regulations made under the Act and four showed minor deviations outside the permitted limits of variation.

With regard to the 28 samples of feeding stuffs examined for the County, 24 were found to be correct within the permitted limits of variation. With regard to the remaining four samples minor deviations only from the guaranteed figures were found.

In no instances were the minor deviations found in eight of the samples of fertilisers and feeding stuffs likely, in the opinion of your analyst, to be to the prejudice of a purchaser.

In tables 31 and 32 will be found particulars of all the samples of fertilisers and feeding stuffs examined for the County. The tables include the results obtained on analysis and, for comparison, the figures guaranteed in Statutory Statements, etc.

Table 31.

Fertilisers.

Sample, Number, and Description.	Formal or informal.	Per cent. Nitrogen.		Per cent. Phosphoric Acid (P_2O_5).						Per cent. Potash. K_2O.		Other Figs. per cent.
				Total.		Soluble.		Insoluble.				
		G.	F.	G.	F.	G.	F.	G.	F.	G.	F.	
13/6/A Leyland—English Steamed Bone Flour/Meal ..	F	0·82	0·86	27·50	32·5							
14/6/A Leyland—Hoof and Horn Meal ..	F	12·75	12·7									
19/11/A Widnes—Hoof and Horn Fertiliser ..	F	13·0	13·35									
20/11/A Widnes—Nitrate of Soda	F	15·5	15·2									
14/10/A —Seaforth—Corn and Grass Fertiliser	F	7·65	7·95		10·8	10·38	9·8	0·60	1·0	8·25	7·6	
15/10/A Seaforth—No. 3 Top-dressing, 631 ..	F	13·07	13·15									
15/6/A Leyland—Ammoniacal Liquor ..	F											A

Table 31—continued.

Sample, Number, and Description.	Formal or informal.	Per cent. Nitrogen.		Per cent. Phosphoric Acid (P_2O_5).						Per cent. Potash. K_2O.		Other Figs. per cent.
				Total.		Soluble.		Insoluble.				
		G.	F.	G.	F.	G.	F.	G.	F.	G.	F.	
16/6/A Leyland—English Steamed Bone/Flour Meal	F	0·82	1·13	27·50	32·8							B
17/2/A Lonsdale—Special Tomato Manure ..	F	5·0	5·2		14·9	7·0	6·9	4·5	8·0	7·0	7·4	
16/10/A Seaforth—Lettuce Manure 420 ..	F	6·0	5·7		5·8	4·0	4·1	1·95	1·7	6·0	6·7	
17/10/A Seaforth—John Innes, Base 17 ..	F	5·1	4·4		6·45	6·4	6·0		0·45	9·7	10·1	
21/11/A Widnes—Sulphate of Ammonia ..	F	20·6	20·7									C
22/11/A Widnes—Autumn Turf Dressing ..	F	2·5 (Organic 1·5)	2·2 (Organic 1·3)		13·7	4·5	3·5	9·5	10·2	6·0	6·55	
23/11/A Widnes—Granular Fertiliser ..	F	9·0	8·9		9·2	8·25	8·1	0·75	1·1	15·0	15·1	
25/11/A Widnes—Sulphate of Potash ..	F									48·0	50·2	
20/2/A Lonsdale—National Growmore Fertiliser ..	F	7·0	7·5		10·6	5·5	6·8	1·5	3·8	7·0	7·0	
21/2/A Lonsdale Nitro-Chalk Fertiliser ..	F	15·5	15·1									D
26/11/A Widnes—Combined Turf Fertiliser and Weed Killer ..	F	5·0 (Organic 3·5)	5·0 (Organic 3·4)		6·4	1·0	0·9	5·0	5·5	4·0	4·45	

Table 31.—continued.

Sample, Number, and Description.	Formal or informal.	Per cent. Nitrogen.		Per cent. Phosphoric Acid (P_2O_5).						Per cent. Potash. K_2O.		Other Figs. per cent.
				Total.		Soluble.		Insoluble.				
		G.	F.	G.	F.	G.	F.	G.	F.	G.	F.	
27/11/A Widnes—Vegarite Plus Aldrin	F	6·0	5·6		9·85	8·25	8·95	0·75	0·90	6·0	6·0	
17/4/A Lower Blackburn—Sulphate of Ammonia ..	F	20·80	20·7									E
1/1/B Headquarters Dried Blood ..	I	13·0	13·0									
2/1/B Headquarters Superphosphate Powder ..	I					18·0	17·8					
9/8/A Rochdale—Super Sand ..	F		8·4									H

G.—Guaranteed.

F.—Found.

A.—Guaranteed, Ammonia (NH_3) 17 ; Found, Ammonia (NH_3) 17·4 equivalent to Nitrogen 14·4.

B.—Found, Moisture 2·3.

C.—Guaranteed, Free Acid (H_2SO_4) 0·025 ; Found, Free Acid (H_2SO_4) 0·005.

D.—Guaranteed, Carbonate of Lime 48 (26·9 CaO); Found, Neutralising Value as CaO 28·5.

E.—Guaranteed, Free Acid (H_2SO_4) 0·02 ; Found, Free Acid 0·007.

H.—Found, Sulphate of Ammonia 39·6, Sulphate of Iron (as $FeSO_4 7H_2O$) 10·6 and Sand 49·2.

Table 32.

Feeding Stuffs.

Sample Number and Description.	Formal or Informal	Per cent. Oil.		Per cent. Protein.		Per cent. Fibre.		Other Figures. per cent.
		G.	F.	G.	F.	G.	F.	
11/3/A Kirkham—INT. Layers Mash ...	F	4·0	4·4	17·5	17·8	7·5	6·2	
12/3/A Kirkham—Indian Meal	F						2·0	A
15/2/A Lonsdale—Ground Linseed Cake	F	7·0	9·5	27·0	27·4			B

Table 32—continued.

Sample Number and Description.	Formal or Informal	Per cent. Oil.		Per cent. Protein.		Per cent. Fibre.		Other Figures. per cent.
		G.	F.	G.	F.	G.	F.	
16/2/A Lonsdale— Mixed Grain	F							C
13/4/A Blackburn Lower— Intensive Laying Meal	F	3·5	3·3	18·0	17·7	5·0	4·3	
14/4/A Blackburn Lower— Pig Fattening Meal ...	F	3·0	3·2	13·0	12·7	5·5	5·4	
9/5/A Blackburn Higher— Layers Mash	F	3·5	3·6	16·55	17·5	6·55	6·6	
10/5/A Blackburn, Higher— National Pig Food, No. 2	F	3·0	3·4	14·0	15·3	6·0	7·1	
16/7/A Bury— Layers Mash	F	3·5	3·7	17·5	16·0	6·0	5·8	
17/7/A Bury— Balanced Dairy Ration	F	4·5	5·7	21·5	20·4	7·5	6·4	
9/9/A Manchester— Maize Germ Meal ...	F	9·0	8·2	10·0	10·1	4·0	3·6	
10/9/A Manchester— Millers Offals Fine Wheatfeed	F					9·5	6·3	D
18/2/A Lonsdale— Barley Meal	F						3·9	E
19/2/A Lonsdale— Sussex Ground Oats ...	F		4·3		9·1		11·7	H
7/8/A Rochdale— Pig Fattening Meal ...	F	3·0	2·7	15·0	13·8	6·0	5·3	
8/8/A Rochdale— Layers Mash	F	3·5	3·8	16·5	16·3	6·0	5·2	
7/12/A Warrington— Layers Mash	F	3·5	4·1	17·5	15·8	7·5	5·9	
8/12/A Warrington— Pig Meal (Fattening)...	F	3·0	3·1	14·5	13·7	6·0	5·8	
13/3/A Kirkham— White Fish Meal ...	F	4·0	5·4	66·0	67·7			I
14/3/A Kirkham— Fattening Pig Meal ...	F	3·25	3·8	14·96	13·7	6·25	4·0	

Table 32—continued.

Sample Number and Description.	Formal or Informal	Per cent. Oil.		Per cent. Protein.		Per cent. Fibre.		Other Figures. per cent.
		G.	F.	G.	F.	G.	F.	
15/4/A Lower Blackburn— Layers Mash	F	3·0	2·6	17·5	17·1	6·0	5·4	
16/4/A Lower Blackburn— Pig Fattening Meal ...	F	3·0	3·1	14·0	14·6	6·0	6·2	
11/9/A Manchester— Coarse Dairy Meal ...	F	4·0	4·75	19·0	16·6	7·75	7·8	
12/9/A Manchester— No. 2 Pig Meal ...	F	3·0	2·4	13·97	14·0	5·1	4·5	
13/9/A Manchester— Coarse Dairy Meal ...	F	4·0	4·1	19·0	18·4	7·75	7·3	
14/9/A Manchester— Calf Meal VA	F	5·0	5·1	24·0	25·2	7·0	5·9	
15/3/A Kirkham— White Fish Meal ...	F	4·0	3·0	66·0	67·1			J
16/3/A Kirkham— Pea Meal	F				22·8		6·2	K

A.—Found, Ash 1·3 and Sand and Other Silicous Matter 0·04.

B.—Found, Sand and Other Silicous Matter 3·4.

C.—Guaranteed, 1 cwt. Clipped Oats, to 2 cwt. Cut Corn to 3 cwt. French Wheat; Found, Wheat 53·5, Cut Maize 34·0, Oats 12·5 and Sand and Other Silicous Matter 0·1.

D.—Found, Sand and Other Silicous Matter 0·2 and Ash 3·9.

E.—Found, Sand and Other Silicous Matter 0·5 and Ash 2·24.

H.—Found, Sand and Other Silicous Matter 0·7 and Ash 2·38.

I.—Guaranteed, Salt (NaCl) 2·0; Found, Salt (NaCl) 1·9. Guaranteed, Phosphoric Acid (P_2O_5) 8·0; Found, Phosphoric Acid (P_2O_5) 8·7.

J.—Guaranteed, Salt (NaCl) 2·0; Found, Salt 1·8. Guaranteed, Phosphoric Acid (P_2O_5) 8·0; Found, Phosphoric Acid (P_2O_5) 9·2; Found, Sand and Other Silicous Matter 0·18 and Ash 23·8.

K.—Found, Sand and Other Silicous Matter 0·02 and Ash 2·9.

PART IV.—WATERS, EFFLUENTS, ETC.

Potable Waters.

One hundred samples of water have been examined during the year 1956 for suitability for drinking or domestic use. Of these 23 came from dairies. Nine of the samples were examined for metallic contamination only and one sample, submitted by the County Architect, was examined

for deposit only. The remaining 90 which were submitted for full sanitary analysis are classified in the following table according to their source and quality.

Table 33.

Waters, 1956.

Source	Fit.	Doubtful.	Unfit.	Total.
Deep Well	18	0	2	20
Shallow Well	2	1	2	5
Upland Surface	46	0	0	46
Spring	12	0	0	12
Miscellaneous	6	1	0	7
Total	84	2	4	90

Sixty-six of the samples in the above table were from public supplies (43 upland surface, 16 deep well, two spring and five miscellaneous waters). Six of these contained traces of nitrate. As this can result from chemical treatment of water or from the reduction of nitrates as well as from pollution, special consideration of the bacteriological findings was advised. All the other samples were of good quality.

Twenty-three of the 100 samples were submitted by the County Medical Officer of Health, one by the County Architect, two by Wrightington Hospital Management Committee, the others being submitted by the following local authorities : City of Lancaster, 2 ; County Boroughs of—Preston, 1 ; Southport, 5 ; Boroughs of—Chorley, 17 ; Darwen, 15 ; Leigh, 2 ; Middleton, 1 ; Urban Districts of—Blackrod, 1 ; Hindley, 4 ; Horwich, 4 ; Orrell, 2 ; Urmston, 2 ; Rural Districts of—Blackburn 1 ; Chorley, 2 ; Garstang, 5 ; Lunesdale, 3 ; Preston, 1 ; West Lancs., 1 ; Wigan, 5.

Toxic Metals in Water.

Samples which had been in contact with lead, copper or zinc, either in service pipes or during subsequent storage, were examined for the presence of these metals.

Fifty-four samples were examined for lead and the results are summarised in table 34. It will be seen that seven of the samples contained significant amounts of lead (the accepted upper limit being 0·3 part per million). The amounts found in the seven samples varied from 0·45 part per million to as much as 2·8 parts per million. All these waters had been conveyed through lead pipes and six of the seven were acid in character. Subsequent treatment of the acid waters has resulted in a marked decrease in their plumbosolvency.

Table 34.

Lead parts per million.	None Detected.	Less than 0·3	0·3 to 1·0	1·1 to 2·0.	2·1 to 3·0.
Number of samples ...	41	6	5	1	1

Of the 19 samples examined for copper only one contained a significant quantity of this metal and in that instance only 0·8 part per million was found. The usually accepted maximum limit for copper is 1·5 parts per million.

Zinc was absent in the nine samples examined for this metal.

Iron was found in 29 of the 39 samples tested for it and 15 of these contained quantities in excess of the 0·4 part per million which is usually regarded as the upper limit above which complaints due to turbidity or staining may arise. The results are summarised in Table 35.

Table 35.

Iron parts per million.	None Detected.	Less than 0·4.	0·4 to 1·0.	1·1 to 5·0.	5·1 to 10·0.
Number of samples ...	10	14	6	6	3

The fluoride contents of seven waters were determined and ranged from 0·04 to 0·16 part per million. These amounts are negligible and would not cause dental fluorosis in children, this condition being brought

about by concentrations greater than one part per million. A complete mineral analysis was also carried out on three of the seven samples submitted for fluoride determination.

Other Waters, Effluents, etc.

Twenty samples wer submitted under this heading.

One effluent, examined for compliance with the recommended standards of purity made by the Royal Commission on Sewage Disposal, was found to be unsatisfactory. Two effluents were examined to trace the source of a large quantity of fuel oil which had contaminated a sewage works.

A deposit in a sewer suspected to have orignated from a dairy proved upon analysis to be almost entirely composed of rancid butter fat.

Five samples of swimming bath water were examined for compliance with the Ministry of Health Recommendations (pH. should exceed 7·0 but should not exceed 8·0 and free chlorine should not be less than 0·2 part per million or much greater than 0·5 part per million). All five samples were slightly high with respect to chlorine content.

Five samples of stream water were examined, four for possible harmful effects upon cattle and one because of complaints of objectionable odours.

Three samples of seepage water were analysed to ascertain their probable sources.

One sample of lodge water was examined to ascertain the cause of death of fish.

Finally, two samples were examined in connection with the excessive corrosion of an air conditioning plant and their analyses indicated that the corrosion was due to acids removed from the air during the purification process.

PART V.—MISCELLANEOUS SAMPLES.

This section of the report includes those samples which, because of their nature or because of the circumstances under which they were obtained, could not be included in previous sections of the report. Three

hundred and twenty-eight samples were examined under this heading and they were submitted as follows : County Medical Officer of Heatlh, 18 ; County Education Officer, 3 ; Chief Officer, County Fire Brigade, 4 ; County Police (Weights and Measures Dept.), 1 ; County Architect, 1 ; City of Lancaster, 74 ; County Borough of Preston, 73 ; County Borough of Southport, 8 ; Borough of Chorley, 1 ; Borough of Fleetwood, 3 ; Borough of Leigh, 78 ; Urban District of Leyland, 1 ; Urban District of Urmston, 4 ; Urban District of Walton-le-Dale, 2 ; Rural District of West Lancashire, 1 ; Forestry Commission, 32 ; 24 samples were also examined for the information of the laboratory. The work carried out on some of the more interesting of these samples is discussed briefly in the following paragraphs.

Atmospheric Pollution.

During the year 1956 work was continued on the measurement of atmospheric contamination for the Borough of Leigh, the County Borough of Preston and the City of Lancaster. Each of these Authorities has three deposit gauges and three lead peroxide instruments in use in its area. The Hesketh Park site at Southport was closed at the beginning of the year but two fresh sites were brought into use by this County Borough in September. Commencing in August, preparation and analysis of lead peroxide candles was also undertaken for the North West Conservancy of the Forestry Commission for sites at eight of their plantations situated along the west side of the Pennines. During the year under review, 116 deposits from soot gauges and 148 lead peroxide candles were analysed on behalf of the above Authorities.

The standard soot deposit gauge consists of a large glass funnel of known area leading into a bottle large enough to hold a month's rainwater. The soot and water collected are brought into the laboratory at the end of each month for analysis, the determinations carried out being those listed in table 36. The sulphur candles are porcelain cylinders of known area which are covered with a layer of lead peroxide prepared under standard conditions. This surface, on exposure at the site, reacts chemically with sulphur gases present in the surrounding atmosphere and when it is examined at the end of the month its sulphate content is proportional to the average concentration of corrosive sulphur gases in the air at that point for the whole of the month. This information is important as it is an indication of the effect of the polluted atmosphere on paintwork, metals, curtains, etc. It should be noted that, even if visible smoke and grit emission from chimneys are prohibited and smokeless zones

beome more common, sulphur gases will still be released into the atmosphere whenever coal or smokeless solid fuel is burned and it is these invisible gases which cause such damage to man, property and vegetation.

The results from the observations, as well as being of local interest, are also used as part of a nation-wide investigation by the Department of Scientific and Industrial Research to study any long term changes in atmospheric pollution and their possible effects on Public Health and other problems. The Forestry Commission's sites although in country areas can be affected appreciably by sulphur-dioxide produced many miles away and the survey has been undertaken to find out the effects of this gas on the growth of young trees.

To illustrate the results obtained in this type of work the average monthly figures for the three sites in the Borough of Leigh are given in tables 36 and 37 on page 115. The Maternity Home and Grammar School sites are approximately one mile to the West and East respectively of the central Town Hall site.

Seven years observations have now been completed for Leigh and the mean yearly values for the three sites are shown graphically in Fig.1. As can be seen from the lower half of the graph the amounts of soluble solids, chloride and sulphate deposited in the gauges in any one year is very much influenced by the rainfall. It has been calculated that 25 to 37 per cent. of the soluble solids are brought down in the rain. If the results are re-calculated allowing for variations in rainfall the corrected figures do not indicated any significant change in the amounts of the soluble part of the deposits over the seven year period. Small changes in the rate of emission of pollution can only be found by comparing one five year period with another five year period, when the changes due to atmospheric conditions tend to cancel each other out. The insoluble deposit is more independent of rainfall. Over the seven years illustrated the amout of ash deposited has kept more or less constant, there has been, however, a marked decline in the amount of combustible material (soot, tar and unburned fuel particles). This improvement indicates that the efforts that have been made since the end of the war to secure a more efficient use of coal have not been in vain.

As will be seen from the top section of the graph there has been an appreciable increase during the last three years in the concentration of sulphur dioxide, as measured by the lead peroxide candles. This increase, shown at all three sites, must be mainly due to a higher level of fuel consumption or to new sources of pollution.

FIG. 1

BOROUGH OF LEIGH, 1950–1956.

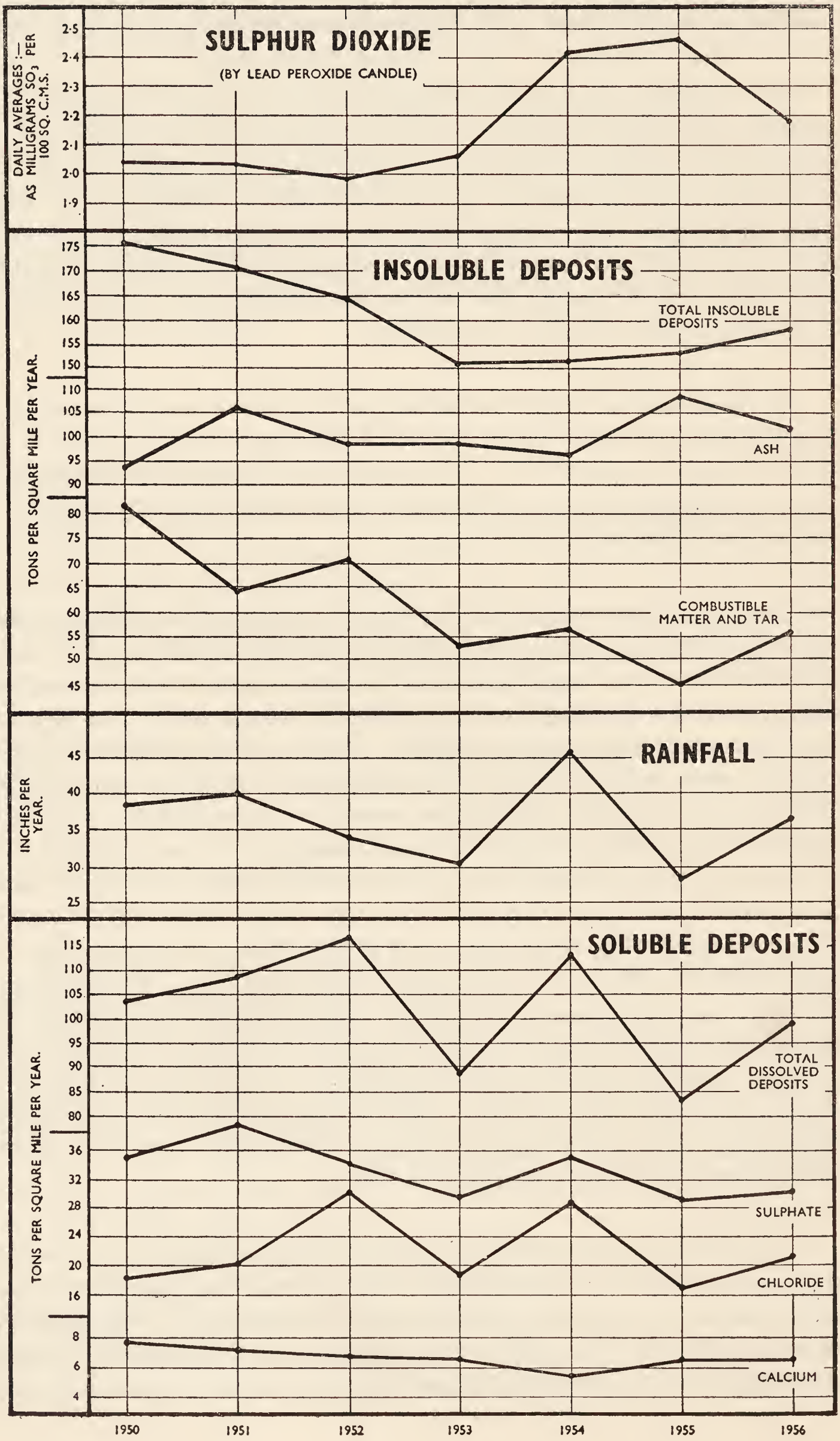

Table 36.

Soot Gauge Observations, 1956.

Monthly Averages in Tons per Square Mile.

Site.	Borough of Leigh.					
	Firs Maternity Home.		Town Hall..		Grammar School.	
Rainfall in inches	3·12		3·03		2·98	
Tar	0·09	9·80*	0·19	20·92*	0·09	8·78*
Carbonaceous matter other than Tar	3·53		7·33		2·55	
Ash	6·18		13·40		6·14	
Soluble Deposit	7·62		8·65		8·46	
Total Deposit	17·42		29·57		17·24	
‡Sulphate as SO_4	2·43		2·62		2·52	
‡Chloride as Cl	1·67		1·95		1·82	
‡Calcium as Ca	0·44		0·69		0·50	
pH	4·0		4·2		4·1	

* Insoluble Deposit.

‡ Included in the soluble deposit.

Note.—The April figures for insoluble solids for The Firs Maternity Home gauge were abnormally high, *i.e.* insoluble deposit 44·3 tons/sq. mile, Ash 29·1 tons/sq. mile.

Table 37.

Estimation of Active Sulphur by Lead Peroxide Method, 1956.

Milligrams of Sulphur Trioxide per 100 sq. cms. Batch "A" Lead Peroxide in Louvered Cover.

Site.	Borough of Leigh.		
	Firs Maternity Home.	Town Hall.	Grammar School.
Daily Averages	1·99	2·54	2·05

Extraneous Matter in Food and in Milk Bottles.

In addition to the samples submitted under the Food and Drugs Act which were found upon analysis to contain extraneous matter the following were also examined :—

Part of Brown Loaf with Needle and Thread.—Sample No. M. 6933.

This sample was submitted by a County Sampling Officer as the result of a complaint from a Hospital that the needle threaded with about five inches of fawn coloured thread had been found adjacent to, but not in the loaf when it was being sliced. The point at issue was whether the needle and thread had been in the loaf. Both the needle and thread were clean and completely free from adhering particles of dough, furthermore the fawn colour of the mercerised cotton was not derived from the brown bread itself. Needles and white cotton and mercerised cotton were placed in brown dough and baked. The needles remained bright and the thread remained perfectly white but particles of dough were found to be attached firmly to the threads and even to the needles. It was reported therefore, that the colour of the fawn thread was certainly not derived from the brown bread submitted with it and that there was no evidence that the needle and thread had been embedded in the loaf prior to baking.

Milk Bottle.—Sample No. M.6906.

This pint milk bottle was submitted by a County Sampling Officer after it had been returned to a dairy with a complaint of the presence of a white deposit which was noticed when the milk was poured out. Upon examination the bottle was found to contain a soft white deposit and a few drops of water. No milk remained in the bottle and the white deposit had formed a line round the inside of the bottle at about the half-pint level. Microscopically the deposit was found to consist of maize starch with a little potato starch and could have been derived from blancmange powder. The starch had not been heated and there was no indication whether it had gained access to the bottle before or after it had been filled with milk.

Milk sample.—No. M.6959.

This partially filled pint bottle of milk was submitted by the Chief Public Health Inspector of an Autonomous Food and Drugs Authority on complaint of taint. The milk itself gave results on analysis which were normal for genuine milk, including the freezing point, acidity, mineral matter and the absence of preservatives. It had, however, a very faint odour suggestive of an ester or fruit flavouring essence although there was insufficient of the contamination to determine its exact nature. It was probable that the contamination was originally associated with the bottle before it was filled with milk.

Milk Samples.—Nos. M.6990 and M.6991.

This sample submitted by a County Sampling Officer, consisted of two one-third pint bottles of school milk still filled with milk but from which the original aluminium caps had been removed. The rims of both bottles were badly chipped and a piece of broken glass was stated to have dropped outside one of the bottles when the cap was removed at the school. The contents of both bottles were examined for further fragments of broken glass. The milk in one bottle was completely free from glass but the other bottle, No. M.6990, contained one very small fragment of glass approximately $\frac{1}{8}''$ x $\frac{1}{10}''$. It was from the neck of this latter bottle that a piece of broken glass had dropped when the bottle was opened.

Milk Bottle.—Sample No. M.7162.

This one-third pint milk bottle submitted by a County Sampling Officer had been emptied and washed before it was submitted for examination but it still contained five fragments of glass, one of which was fused to the bottom of the bottle. The bottle itself was not chipped and the fragments, which resembled twisted glass ribbon, had every appearance of having been attached to the inside of the bottle in the form of a twist of molten glass during the manufacture of the bottle and then subsequently broken off as the result of cleaning or other handling. The refractive index and the density of the fragments were identical with the corresponding figures for the glass of the bottle itself.

Foreign Matter in Radiator of Motor Van.—Sample No. M.6962.

This sample of yellow wax-like material weighing 1·7 grams was submitted by the Chief Public Health Inspector of a County District who stated that a quantity of similar material had been found inside the radiator of a motor van at a salvage depot and that it had seriously interfered with the efficiency of the cooling system. Upon analysis the sample gave the following results :—

*Oil	65·1
Protein	29·9
†Mineral Matter	3·2
Undetermined	1·8
	100·0

* Including phosphoric acid (as P_2O_5) 1·1 per cent.

† The oil yielded the following analytical figures.

Saponification Value	191
Iodine Value (Wijs)	74·8
Refractive Index at 40°C.	1·4671
Acid Value	10·5
Unsaponifiable Matter	3·0%

The above analytical results were consistent with the sample being egg yolk solids. A probable explanation of the rather surprising presence of this material in the radiator was later brought to the notice of your Analyst in that several cans of frozen egg had been surrendered for destruction and brought to the salvage depot some time previously and it can only be assumed that someone out of a spirit of mischief had poured some of the liquid egg into the radiator.

Potatoes.—Sample No. M.6988.

This sample was submitted by the Chief Public Health Inspector of a County District in order to ascertain whether the musty taste of the potatoes was due to chemical contamination or to staleness. The most likely chemical cause of this type of taint which, however, in this instance was more noticeable near the skin than in the centre of the potato, was benzene hexachloride used as a soil insecticide. The sample, however, yielded no more organically combined chlorine than a control experiment on good quality untainted potatoes and from this it follows that the amount of B.H.C., if present, could not be more than 0·8 part per million. In the U.S.A. a limit of five parts per million of B.H.C. is permitted as a residue in food. The results of the examination for B.H.C. were, therefore, inconclusive although it could be said with certainty that a harmful amount was not present. On the other hand the sample was submitted for examination towards the end of June and the potatoes had all the appearance of being old stock, this, coupled with the fact that the part nearest the skin was most affected, would suggest that the musty taint was the natural result of deterioration due to bad storage rather than that it was caused by chemical contamination. Some of the potatoes were also examined by an Agricultural Advisory Officer of the Ministry of Agriculture, Fisheries and Food and also by a member of the staff of a University School of Agriculture both of whom were satisfied that the potatoes were unpalatable but could not definitely assign the cause. There is no doubt that the complaints were justified and before this investigation was completed the dealer concerned had agreed to take back the whole of the consignment and refund the purchase price.

Anti-Smoking Tablets.—Sample No. M.6913.

These tablets were submitted by a County Sampling Officer in order to ascertain whether they contained any harmful substance or whether, in the opinion of your Analyst, a declaration of composition should appear on the label. The tablets were found to be similar in composition to peppermints except that they contained a very small quantity of copper salts equivalent to 300 parts of copper per million parts of the sample. While this amount of copper is more than would be permitted in a food it is much less than the medicinal dose of copper sulphate. The astringent taste of very dilute solutions of copper or silver salts is often used as a means of creating an aversion to smoking. As the sale of the tablets did not appear to come within the definition of a "substance recommended as a medicine" under the Pharmacy and Medicines Act, 1941, your Analyst did not consider that it would be possible to require that the formula be disclosed on the label.

Dried Full Cream Milk.—Samples Nos. M.6963 and M.6964.

These two samples were submitted by the Chief Public Health Inspector of an Autonomous Food and Drugs Authority as the result of a complaint that a baby became ill after having feeds made from the dried milk. Both samples consisted of roller dried milk powder and their solubility at 20°C. was only of the order of 74 per cent., whereas at 50°C. the solubility was 92 per cent. These results, due to the more severe heating of the milk during manufacture, are typical of roller dried milk ; spray dried milk powder on the other hand is usually almost completely soluble in cold water. It was suggested that the trouble experienced might be due to not reconstituting with water at a sufficiently high temperature or possibly to a change over from one type of dried milk powder to the other.

Anti-Freeze Mixtures.—Samples Nos. M.7058 and M.7132.

These two samples of anti-freeze mixture for use in the cooling systems of motor vehicles were examined for the Chief Fire Officer. The freezing points of solutions of the mixtures were determined in order to ascertain the degree of frost protection afforded by their use and tests were also carried out to find out whether there would be any appreciable loss of efficiency after they had been in use for some time or whether any corrosive action would occur. In addition, two samples, Nos. M.6881 and M.6882, of water from the radiators of motor vehicles to which anti-freeze was stated to have been added were submitted in order to ascertain the amount still present. Upon examination, however, the samples were

found to have freezing points closely approximating to those of pure water indicating that no significant amount of anti-freeze was present in either sample.

In addition to the above, mention should also be made of the following examinations carried out for other departments of the County Council. Two samples of Rose Hip Syrup and eight samples of Cod Liver Oil preparations were submitted by the County Medical Officer of Health under the Co-ordinated Purchasing Scheme for food stuffs for Child Welfare Centres in order to ascertain whether the samples corresponded with their declared compositions and particularly if the Vitamin potencies were as stated. The County Medical Officer of Health also submitted five bottles of chloroform, used in the Ambulance Service, in order to ascertain whether, after storage, the chloroform still complied with the requirements of the British Pharmacopoeia and particularly to find if any undesirable decomposition products had appeared in any of the samples. The samples were approximately 18 months old and were still in good condition although there had been appreciable loss due to evaporation. The Chief Education Officer submitted a sample of Sausages and a sample of Fat rendered from the Sausages during cooking in order to ascertain whether the sausages conformed to specification ; he also submitted a sample of liquid Soapless Detergent taken from the supply in actual use to see whether it was in accordance with the Contract. The County Architect submitted three samples of deposit found in the water supply of a school Finally, a sample of disinfectant was submitted by an Inspector, appointed by the County Council under Section 25 of the Pharmacy and Poisons Act, 1933, in order to ascertain whether it was a poison included in Part II of the Poisons List Order, 1953.